

AN (103)
EXPLANATION
OF THE FASHION
AND VSE OF THREE
and fifty Instruments of
CHIRVRGERY.

Gathered out of *Ambrosius Pareus*, the
famous *French* Chirurgion, and done into
English, for the behoofe of young Practi-
tioners in Chirurgery, by H. C.



London Printed for Michael Sparke, 1634.

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The Preface.



TH E Art of Medicine which we commonly call Physicke, is conversant about the health of the Body of Man; the most noble Subject of the whole Creation, if wee except onely the Soule, whose conjunction also with the Body, as it makes some of the bodily operations more sublime, so it puts a greater honour upon the Art whereby such sublime operations are preserved in their due tenor and integrity; or being vitiated are restored to their pristine perfection. This Art (as all others) had her Infancy, Childhood, Youth, and is at length growne to that perfection of strength and accomplishment of parts, that the Additions which are now made may seeme but a sagination to over-burden it with unnecessary store; albeit we may not doubt but that some Moderne Divine wits, may not onely gather new consequences from the Dogmaticall Principles of the Ancients, and so amplifie the Revenues, but also purchase unto our Art new Inheritance. In the Infancy of Physicke, it fared with her as it doth with yong Children, whose indulgent Parents make observation of and blesse themselves in any towardlinesse bewrayed by speech or gesture, which may promise pregnancy in the time to come. The visible effects of Art in healing of wounds, drawing Arrowes out of the flesh, reposing luxed joynts, setting broken bones

The Preface.

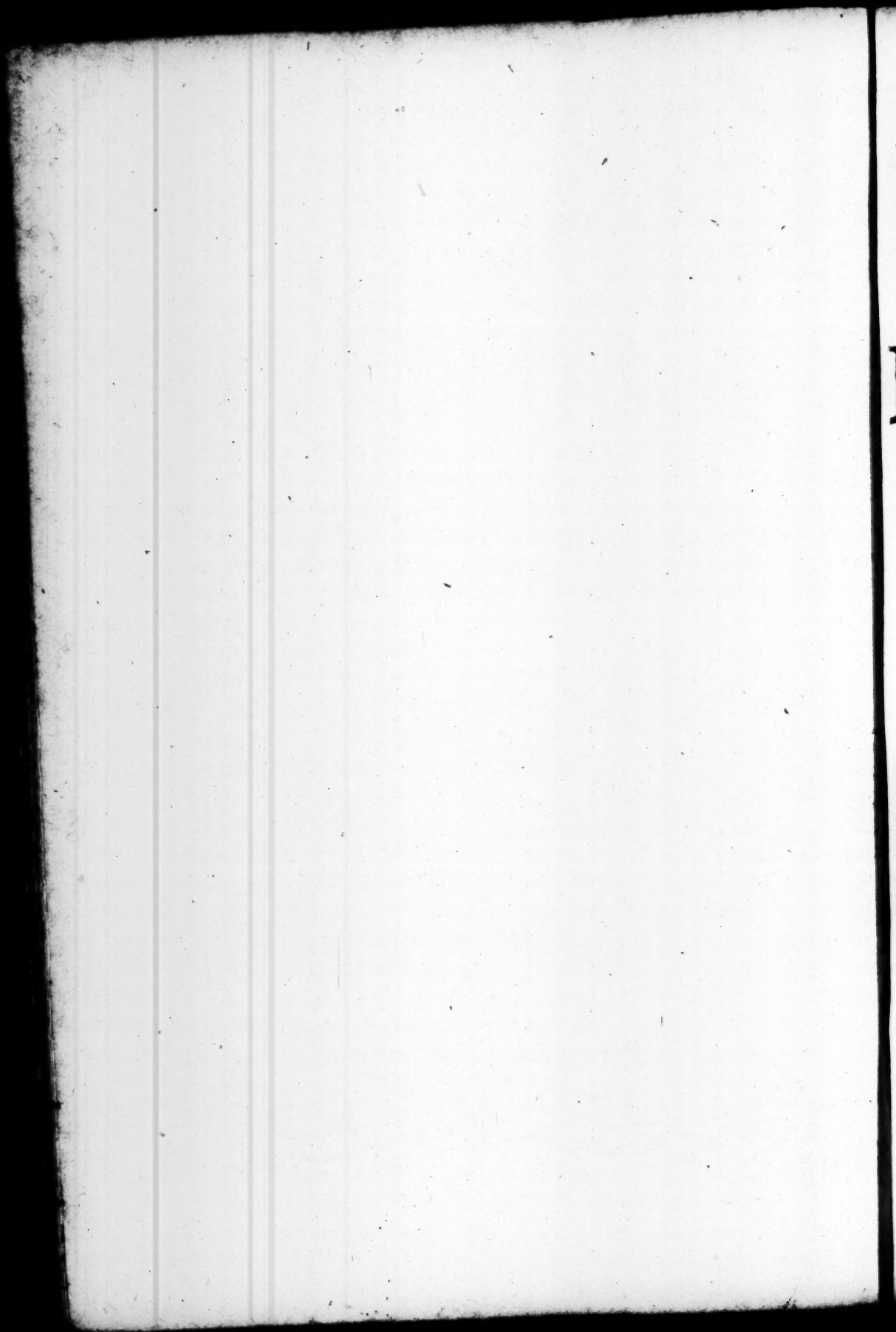
bones, and the like, were the first pledges of future proficiency, and the operations therefore were worthily had in great estimation. This part of Physicke was after called Chirurgery, wherein, though learned men of all Ages have taken great paines, as well in inventing instruments as remedies; yet the manuell administration they most what referred unto servants whom they trained up for that onely purpose; Not that I suppose any worke of Art to be dishonourable for the Artist to bee employed in; but the sweetenesse of contemplative knowledge, and the State and Estimation of Curing secret and abstruse diseases, led those Sages from that which may be performed by others, to set themselves apart and to spend their time in the disquisition of many subtilties which arose in the Physiologicall, Semeiomaticall, Pathologicall, Prognostique, and Therapeuticke parts.

And hence onely it is, that Chirurgery is famed for Antiquity: The evidence also of Sense (because a Chirurgian may for the most part see his way before him, and feele how his Cure commeth on) gave it the priviledge of Certainty above Physicke, wherein sometimes Fortune, Nature alwayes hath an especiall claime. But neither that Antiquity, nor his Certainty doth free Chirurgery from the Alleageance shee owes to Physicke; yea, they both intend it rather: Antiquity, because it ushereth Physicke into the World, but as a Handmayd of Honour; Certainty, as being a pledge onely and gage that Faith and affiance might be put in that Art, in whose courser administrations men might see and feele the prooffe and effects.

My meaning is not hereby to Elevate the worth of Chirurgery, but to put more honour upon it by assigning thereto a prime place in the Commencement, and a due respect throughout the whole progresse of the Art of Physicke. In so much as those who are the most expert Chirurgians, and would be so esteemed, doe strive at this day to furnish themselves, not onely with the Physiologicall part (which they take to be of absolute necessity for their use) but also with the Principles at least and Aphorismes of all the rest. It cannot be denied but that the manuell exercise is better learned by practise and experience than out of bookes: but as in Physicke there bee many, so in Chirurgery there be some speculations, which who so is incapable of (and all those are incapable, who have not at least some competent knowledge in the Theorie of Physicke) he shall never be worthy to be accounted a Master in Chirurgery. But to leave that to be excolated by the posterity

The Preface.

ty: For the present I have been prevailed with, to this second edition of the Anatomy, to adde in favour of young Chirurgians, the deformation and explication of some such Instruments of this Art as may be of most use, Wherein I will not tye my selfe to any method, because neither the peeces are perfect in their number, neither will the Volume to which the Anatomie is risen, admit of so large Addition. It shall be sufficient therefore briefly, and without any great circumstance to exhibite these formes and the use of them out of *Parvus*, for I could not chuse a better Author, that you may know the Printer will not spare for cost, to present you with the rest, if he finde these acceptable; especially if he can obtaine the body and substance of the Art of Chirurgery, to accompany these shadows of a few Instruments and operations. Neither are you to expect curiosity in these very descriptions, but facility rather: for they are ordained for the use of beginners. And even for those rather, that they might understand how other experienced Chirurgians goe about their worke, than that by this onely manuduction, they shoul'd rashly adventure upon all these Administrations: but rather that they should be stirred up to observe the footsteps of others, who are better able to guide them; which they may doe a great deale the better when they have the Notion of those workes in their heades, before they have their parts in the Adventure. As also if they finde that Notion to be imperfect, they may resort either to the counsell, or to the experience of such as can perfect it, and assoyle their doubts, which I foretell them will be many and important. Take this therefore in good part, such as it is, and that may haply perswade me to doe more for thee. Take my counsell also to exercise thy selfe rather in these and such like operations, than to bungle in the Practise of Physicke, wherein I am certaine thou hast lesse understanding, if at all thou understandest thy selfe.





THE
PRACTISE
OF CHIRVRGERY
VVITH THE VSE OF
Divers Instruments.

CHAP. I.

For the opening of Tumors.



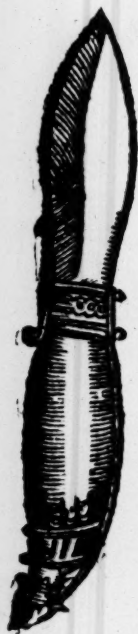
When a Tumor is ripe, that is, when there is in it *Pus confectum*, at which time all symptoms of heate, paine, and the like, are mitigated, and the head of it is growne mucronated and soft, then it is time to open it, and not before. Neither ought the Chirurgian afterward to linger, for feare the humour shut up in the flesh, should contract a venemous, or at least a malignant disposition, and by his contagion, infect the neighbouring parts. And this is especially to be feared, where the adjacent parts are of more exquisite sense, or of greater dignitie: as also where they are more subiect to the confluence of excrements, or in a more prone position; for the waight of humors will naturally decline.

This apertion is made sometimes by a phlegme or Lancet, sometimes

times by a penknife, as as wee call it, sometimes by Canteries.

The phlegme or Lancet, is that Instrument wherewith they use to open a Veine, and may be of use in tender and soft parts, and where the Apostemation is outward: The figure of it you have here under set.

The forme of a Phlegme.



But if the Apostematō lie deeper, or if the Tumor be harder, or the skin thicker, then the Penknife is fitter, for with it the hand may bee carried more steadily; you may strike deeper (if need be) and without danger that your Instrument should faile you. Here you have the figure joyned to the handle, but turned out, to shew the croo-

ked blade marked with [C] for that is most fit for almost al manner of incisions. Where there is any different forme to be used, you shall have it expressed.

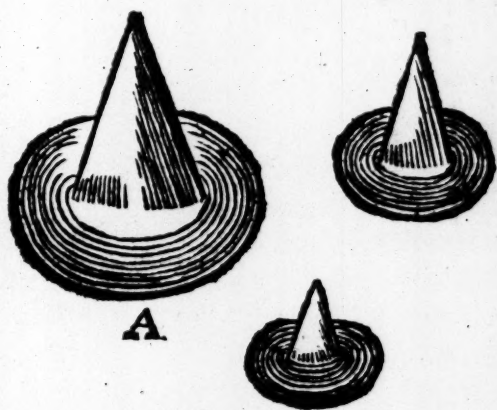
The forme of the Penknife standing out of his banale.



But because some faint-hearted Patients are afraid of this Instrument, Chirurgians have devised to fasten the point of a Lancet or Knife in the midst of a peece of Coyne, to stand out as far as they would have the wound to be deep. That coyne they cover with some thin Cearecloth, to hide the edge or point, pretending that cearecloth to bee the Medicine which

which shall make way for the matter to issue; but when they have cunningly conveyed the Coyne upon the Apostemation, suddenly they presse it as hard as they meane to make the Incision deepe; and therefore they are not without divers of them, some larger, some smaller, some with deeper or longer points, some with shorter and shallower, according to the worke they are about. Heere you have three figures of them: the letter A shewes the round plate, or coyne wherein the point of the Knife or Lancet is infixed.

Plates or Coynes of Silver or other Mettall wherein the point of a Lancet is fastned.

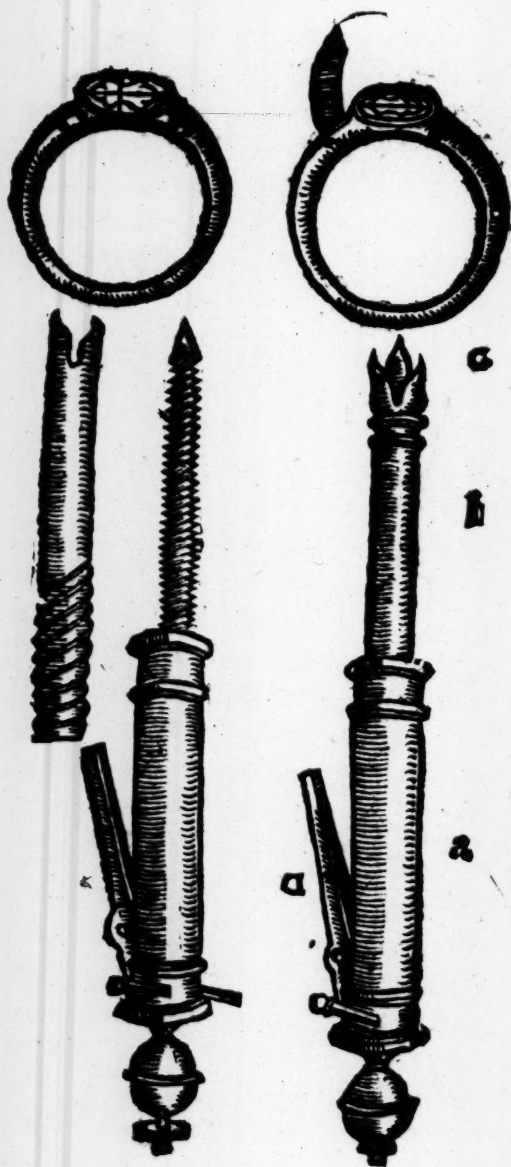


Other cleyly devices also there be to open Apostemations; as rings wherein the point of a Lancet or Knife is concluded and fastened, at pleasure to bee let out, when the Chirurgians finger is neere the Apostemations. As also hollow pipes made of Cane, Plate, or Wood, as big as a little finger, wherein

are contained other smaller pipes as bigge as a Swans quill, in the end whereof is fastened the point of a Lancet, at such length as the Chirurgian thinkes fit for his operation. At the end of the greater Cane next his hand standeth a Vice or Spring ready bent; which Spring when the Chirurgian looseth, the smaller or wider Cane whereto the point of the phlegme is fastned, suddenly is darted out of the larger Cane, and striketh the Apostemation as deepe as is desired, much like these bable quills which children buy at *Bartholomew Faire*, out of which they can shoot a Snake to scare their fellowes: and indeed these devices are but bables, the phlegme or Penknife are more certaine Instruments, notwithstanding, because some nice people are taken with such quaint devices, you have them hereunder delineated and explained.

Other

Other Instruments to open Apostemations.



*Rings wherein the points of
Lancets are hidden.*

*Certain small Canes or
Trunkes wherein Lan-
cets are fastned, called
Manucla or Anteridii.*

*a. Shewes the greater
Cane or Pipe.*


*b. The smaller Cane or
Pipe contained within
the greater, to the top of
which the Lancet is
fastned or joyned.*

*c. The Lancets point ap-
pearing.*

*d. The Spring or Vice
which shooteth out the
Lancet called Manucla.*

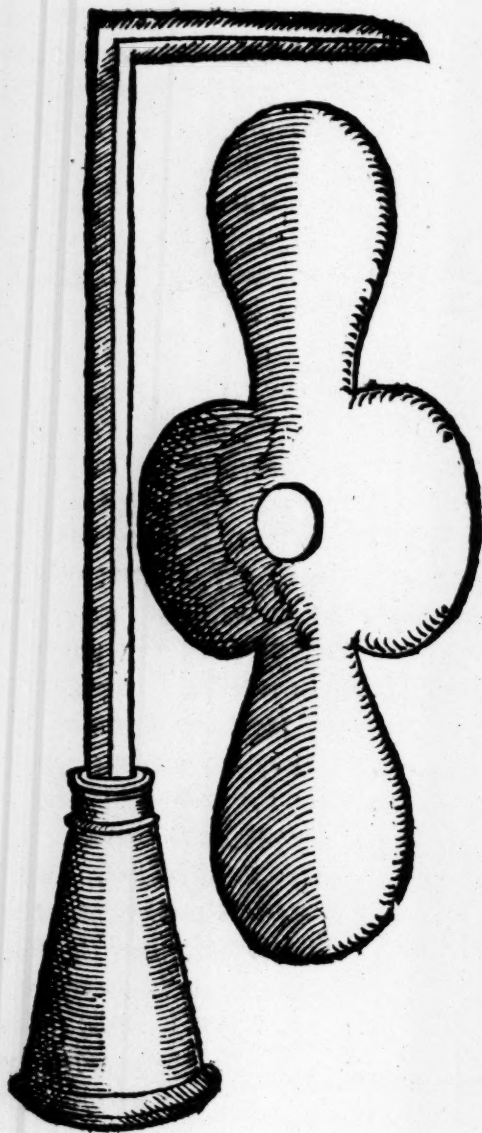
CHAP. II.

Of Cauteries.

ometimes the Patients nicity, sometimes the place, sometimes the condition of the Tumor, require that Knife and Lancet be forborne, and then Apostemations may be opened with Cauteries. They are either actual, or potentiall. The actual Cautery is an hot iron. And this alwayes fittest where the matter concluded is poysonous, whether it be an Apostemation, or upon the biting or stinging of poysonous creatures; for fire is a prompt worker, vehement also and sudden, and the Eschar will sooner loosen and fall: Beside, the vehemencie of actual fire makes a greater impression upon the adjacent parts, and keepes the issue longer open, which is the reason that in pestilent constitutions, we use to make issues to choose with actual Cauteries; and because the time requires it, I will tell you where it is fittest to make them, to wit, in the right arme, a little under the second muscle, called *Deltoides*; and againe on the outside of the left legge, betwixt two and three inches under the knee. But you must remember that I give you this counsell of using Cauteries in cases of poyson, then onely when the poyson is in or neere the surface, and not when it hath insinuated it selfe deepe into the body. For if the actual Cautery reach the poyson, it will extinguish it; if cannot reach it, it will exasperate it more; beside, the paine and error it carries with it, weakens and affrights the Patient much, and shakes his spirits. Notwithstanding, there is frequent use of these actual Cauteries, in the *French* disease, and they are made differing, according to the severall parts whereto they are to be applyed; all which for me to prosecute, were against my present purpose. You shall finde a little hundred of them delineated in *Ambrose Parries* iij. booke, which he wrote *De Lue Venerea*. I will content my selfe to particularise in one or two, and these also described by *Pareus*. In his seventh booke and the fift chapter, is an Instrument to be used in the cauterizing that tumor which is called *Ranula*: (it is under the tongue, and corrupts the speech.) This Tumor if it be any other way abated, (saying by the burning iron) it will grow againe; he maketh such a devise for it. First, he frames a plate of Iron, such

such as you see hollowed on the inside; and with a hole in the midst. The mouth is held wide open, and the plate applied to the Tumor, so that the hole therein may fall just upon that part of the Tumor, which you would open: then with a red hot crooked iron like this in the figure, pierce the Tumor, and therewithal with your thumb under the roote of the Chin, beare up the Tumor with some force and strength, that you may pierce it the deeper, &c.

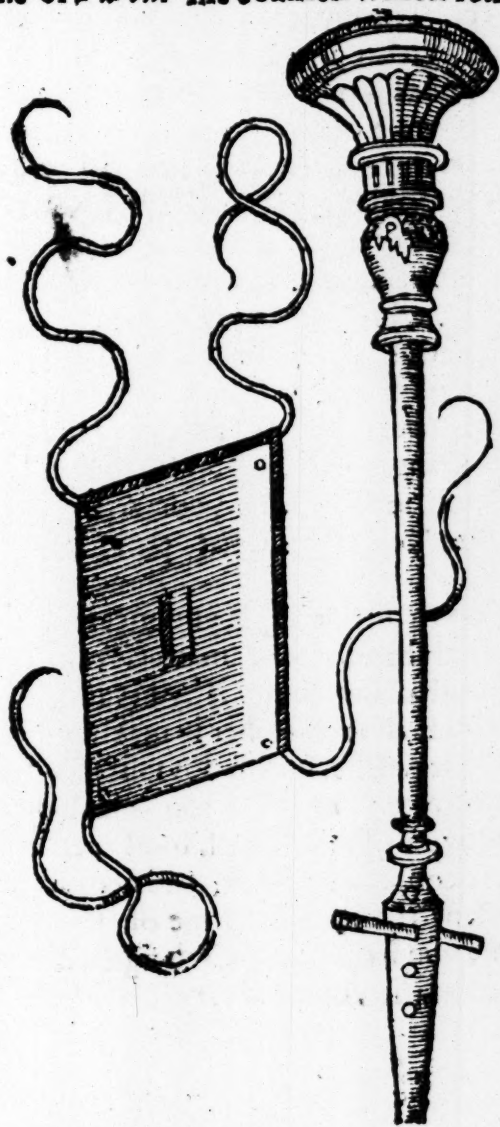
The forme of the Iron plate and of the actuell Cautery.



In the tenth Chapter of the same Booke, hee describes the manner of the use of the Cautery in *Empyemate*, that is, when upon a squinzie or pleurisie or other wayes sometimes, there is a notable collection of purulent matter in the capacity of the Chest. This is a work not to be adventured upon by one man, but hee had need of the best help he can get; neither will the skilfullest Chirurgian undertake it, without the advice and presence of the learned Physitian. But it is to be performed in this manner. The Chirurgian must begin to unnumber the ribbes, from beneath upward, till he come to the third true rib, betwixt that and the fourth must the work be done. Where the Chirurgion shall place (upon the side the Physitian shall designe) a

iron

iron plate with a hole in the midst, fit for the Cautery to enter into. That plate having strings at the four corners, must be tyed on the other side of the Patients body, so fast that it may not move, and it must also be bowed some what compasse, that it may comply with the fashion of the ribbes. In the Cauterizing iron, there must be divers holes, wherethrough you shall put a bolt of iron, at that distance from the point which you will allow to make the perforation: so if the plate be fit, the hole of it even with the distance between the third and fourth rib, the Cautery red hot, and the bolt in it, that it pierce not to deepe: Finally the Chirurgians hand steady, and the assistants enow to hold the Patient, the worke is soone and safely performed. And this operation is called *Paracentesis*. Some of *Pareus* his counsell which followes I doe not so well like.



A type of the actuall Cautery, and his plate to be used in the opening of the side.

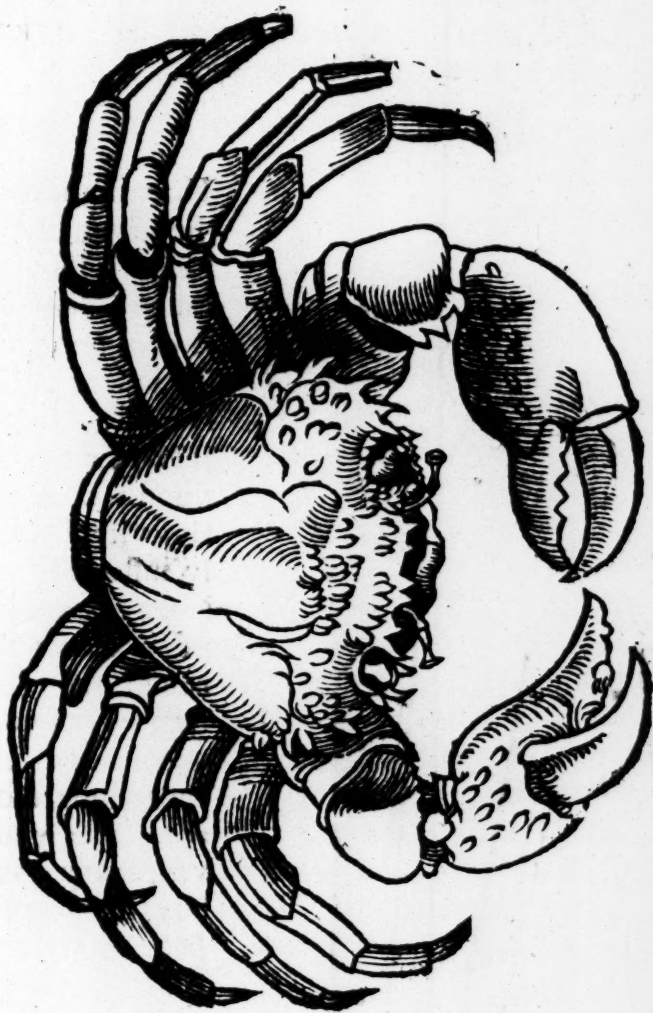
There is an other like operation in the Fistula of the eye, but I leave or reserve that as more curious for skilfull Artists to think better upon. Neither am I ignorant of many other actuall Cauteries made of melted Lead, scalding water, roots of Gentian and the like burnt red hot; nor of that *Ustio Arabica*, mentioned by *Plinie*, approved and described by *Dioscorides*, and commended by some of the late Writers for the Hip-gout. But it were beside my purpose to insist upon that or any other

other particulars. Even potentiall Cauteries I permit, because I li-
mit my selfe for the present, to describe a few Instruments onely.

Notwithstanding before I part from this place, I will take so
much liberty, as to advise the Novice Chirurgian what hee ought
to represent to himselfe before he open any Aposteme, either with
the knife, or with the Cautey.

The first thing is, that some Apostemations are mortall, and
some so dangerous that they must not be medled with at all, or not
without great circumspection and assistance: as all apostemes of
inward and noble parts, though they appeare outward, as those
in the Liver, spleene, &c. Againe, beware of opening an Aposteme
in an acute and originall Fever. Thirdly, take heed you mistake not
Ruptures for Apostemations, either in the flanke or in the cod.
Fourthly, take heed of Apostemes which happen in the heads or
tendons of Muscles. Fifthly, beware of an Aposteme, if the basis of
it appeare broad without any visible acumined. Sixtly, you must
open an Aposteme as neere the declining part of the tumor as you
can, that the matter may issue out of it, of it owne accord without
forcing. Seventhly, in incisions beware of a great branch of a veine,
or more especially of an artery, which you may many times meete
withall, in the necke, armes, and legges. In the eight place, if you
meete with a tumor in the legges of a dropisie body, where the drop-
sie is confirmed, and the Liver overthrowne, take heed of opening
it, for it will never heale but Gangrenate: and you shall bring mis-
ery and death upon your Patient, and discredit your Art. The like
may be sayd of an old and effete body, in what part soever the
Apostemation be.

Finally, (for it were tedious to pursue all) if you meete with an
Apostemation which will yeeld abundance of matter, take not all
out at once, lest you take life and all, but empty it by fits and degrees.
Some of these Cautions you must also remember in making of issues;
but for the manner of doing that worke, it is so obvious that I neede
not insist upon it. I have forgotten my selfe too much already.
Onely because the *Cancer* above all Tumors hath most neede of the
actuell Cautey, if a man may come to apply it; and because the fa-
shion of a Crab doth represent the horrid forme of that Ulcer,
whence also it hath his name; you have here a Crab figured to make
unto you (as it were) a representation of a *Cancer*.



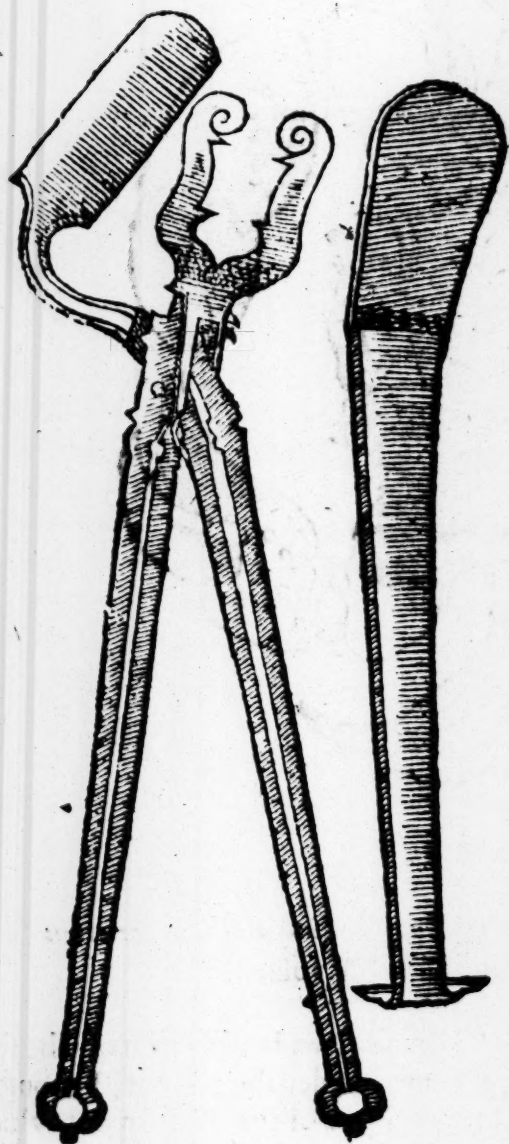
CHAP. III.

*Of some Instruments to be used in swelling and exulceration
of the Columella or Vvula.*

BEcause in the former Chapter I made mention of the swelling of the *Ranula*, a Tumor under the tongue, I thought fit in this place to add the figure of that Instrument which they call *Speculum oris*, together with a *Spina* to hold downe

downe the tongue, because by it the mouth is kept wide open, and the tongue couched, when the Chirurgian would worke in it by section, constriction, or any other operation.

Speculum Oris.

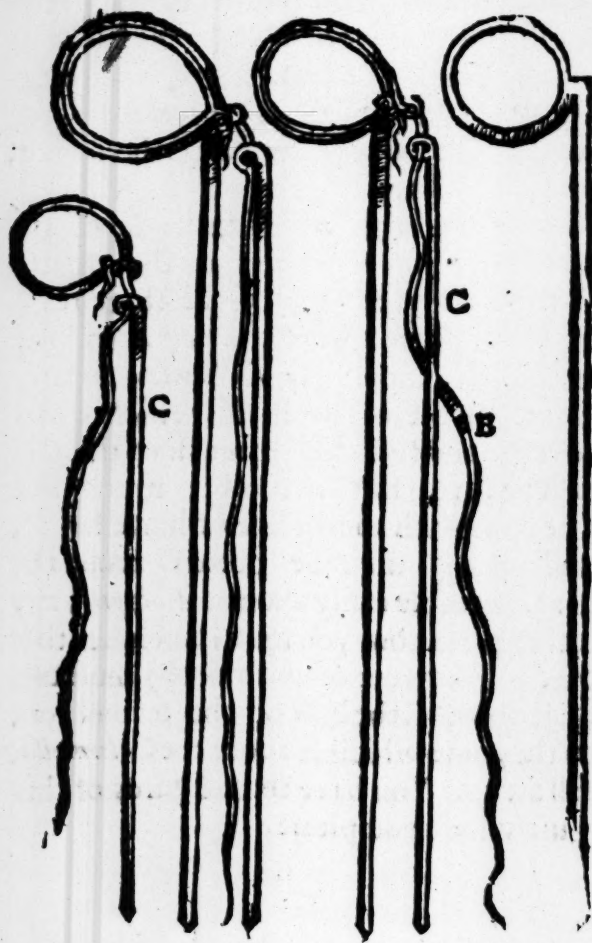


Now in the mouth, near the *Isthmus* of the throat hangs a fleshy particle called *Columella*, we call it commonly the *Vuvula*, but indeed it is then only truly *Vuvula*, when it is swelled and hangs low upon the throat; sometimes it will be extremely inflamed, and look like a ripe and blue Grape of a *Cancerus* color, round and fiery. Mistrust it then you may opening the veins under the tongue, &c. But *Pareus* says you must not vex it any way, but it be rather swelled than inflamed, and that by a distillation from the head then (if other ordinary courses will not abate) but that it lyes continually upon the throat, as it would choake a man he may flye to the help of Chirurgery. And for this purpose *Honoratus Castellanus*, Physician Ordinary to the French King

King, devised a fit instrument to twitch some part of it, which part will in short time fall off, and no fluxe of blood will follow it. First, he frames an iron rod, the length of a mans finger, and to the top of the rod fastens a ring about the bignesse of the end of the ring finger, the upper circumference whereof is a little hollowed, that a thred of silke may ride in it: Then he provides another rod, with a hole drilled in the top of it, through which the tayle of the thred falleth after the riding knot, or noose is put upon the circumference of the ring. These rods, with the noose of the thred upon the ring, and the end issuing through the hole of the second rod, hee puts into the mouth, till the ring be put upon the *Columella* so farre as he listeth; then he drawes the noose of the thred, which easily separateth it selfe from the ring, and twitches so much of the *Columella* as it comprehends. The thred had neede bee strong and waxed, or I thinke it may be done with a small line of horse haire, whose noose haply will stand open, till it be gotten about the *Vulva* without an instrument, but more easily about a *Polypus*, any Warts or excrescences in other parts; but you must remember that every day the noose (whose end hangs out of the mouth) must bee gently strained, by putting it through the hole of the second rod, and thrusting the rod up to the noose which is about the *Columella*, till the unprofitable part fall away. You have three figures of this instrument, that you may use which you please.

Y 3

The



The type of Constrictor
Rings with threads fast-
ned to them, to twist
off a part of the Colum-
mella, Polypus or the
like, if there be need.

- A, The rod with the
ring, whose upper cir-
cumference is some-
what hollowed.
- B, The thread or line
which compasses the
ring with a noose or
running knot.
- C, The second rod
through which the
thread passeth by a hole
in the top of it where
by the noose is to be
gently strayed.

But if beside this swelling or relaxation of the *Colummella* (of which we have already spoken) there is also an eating Vicer ad-
joynd (as sometimes it happens) and a fluxe of blood with it; then
it will be necessary to seare the Vicer with a Style blunt at the end
and red hot running into a hollow pype, somewhat thicke, neerer
the end whereof, a little window or gutter, as it were, is cut out, so
that the hot end of the Style, through that window or gutter, may
arrive just at the Vicer, without offending any part of the mouth
beside. The formation of all the parts of which instrument, you
have hereby annexed.

The

The pipe guttered, or with a small window cut out neere the end, unto which the redhot Style is conveyed.

CHAP. IIII.

Of the Paracentesis in the Dropisie.



Here is a great question among Physitians, whether it be according to Art, to administer the *Paracentesis* in a Dropisie. I will not

stand to dispute the question, onely one objection there is which must be satisfied. If the Liver be not vitiated, say some, then the Dropisie may bee cured by other meanes. If it be vitiated, then this operation is in vaine, because the cure is desperate; and in a desperate cure to torment and travell the Patient so much, and beside to discredit a mans Art, is a trick of him that seekes worke for his owne ends. I answer, that there is a great Latitude in the indisposition of the Liver in a Dropisie. If the Liver be in fault alone, or originally, as alwayes it is not: For sometimes the Liver is over-cooled indeed, and the serous matter thereupon gathered in the capacity of the *Abdomen* in great quantity, yet such a Liver may be restored, especially if it be not perboy-

led too long in that Lye. Sometimes it is *schirrhous*, and circumscribed, and yet is recovered, if the water bee in due time taken away. But if the worke be deferred till the whole frame and tenor of the Liver be overthrowne, then indeed it is in vaine to open the *Abdomen*, because a principall part is utterly forfeited. But if there

be any hope that the Liver may be restored (which none but the diligent Physitian is able to discern) then the *Paracentesis* is fit to be undertaken after this manner. If the Dropsie proceed originally from the Liver, the section must be made in the left side, the breadth of three fingers lower then the Navill, as neare the edge of the right muscle as you can imagine; and so you shall avoyde the white line and the tendons of the rest of the muscles of the *Abdomen*. Place therefore your Patient upon his right side, then let the Chirurgicalian pinch up the skin with two fingers in the place before mentioned, together with the fleshy pannicle under it, and so pinched and held up, hee shall divide it overthwart to the very flesh, and then draw up the skinne hee had hold of as hard as hee can toward the Navill, which when it fallles againe, will assist him much to consolidate the wound he makes in the flesh. Then let him with great care divide the flesh of the muscles and the *Peritonaeum* with a moderate wound, and so that he offend not the Kell or the Entrals; Into that wound he shall insinuate a crooked pipe made of silver, of the bignesse of a Goose-quill, and about two inches long, with a broad head that it slip not in; in that head make two holes for strings to runne in, whereby the Quill may be steadily tyed about the body to the wound. Into the head of the quill put a Sponge, and when you would let it runne, take out the Sponge, but the quill or pipe you must not take out, before you have let goe as much water as is fit; for if it be once out, it will not easily be gotten in againe, without trouble and paine to the Patient. For the proportion in letting out the Dropsie water, I must referre you to the advise of a learned Physitian, who, according to the quantity of the Tumor, and the strength of the Patient, must moderate your operation. Finally, the Chirurgicalian must be carefull (beside the tyes of the quill to hold that steady) to provide also fit ligatures, and strong with pledgets, &c. to contract and make firme the orifice of the wound whereinto the quill is insinuated, lest the humour get vent by the wound and spoyle all. The figure of the quill with his head and tyes, you have hereby expressed.

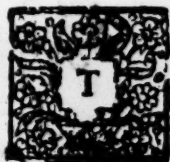
The

The fashion of the Quill or Pype to draw out Dropfic-water.



CHAP. V.

Of Ruptures.



Here be many sorts of Ruptures, or Relaxations, whose names are taken from that which falleth downe: for it is the *Peritoneum* or Rianne of the belly onely which is broken or relaxed in them all. Sometimes the gut, sometimes the kell, some-

times both fall together; and the Relaxation is at the productions of the *Peritoneum*. Vnlesse it be that we call *Exomphalos*, when the *Peritoneum*, at the Navell is relaxed or broken, and the guts or kell, or wind, or flesh, or humor, make a Tumor in that place, which I have seene as big as a mans head. I will not particularise heere of all the kindes, onely let me tell you, that in children a cure may bee made according to the first intention as we say; but after childhood not so, or at least very rarely, and by accident, as it happened to the Priest *Parcus* makes mention of; then the Trusse is most in use. Sometimes also the golden ligature.

For the Trusse, it is made diuers wayes by diuers men, some of Holland, some of Fustian, of Tassata, &c. Some stuffed with Bumbast, some are made of Steele which in my opinion are the best and the easiest, if they be made light and fit. All the skill is in fitting them to the Patients body, but first the Tumor must bee gently returned up. I know there is a trick lately brought out of France to trusse a man up with I know how many Eills of Holland, and I beleeeve there may bee some skill in the manner of the tying of the *Fascia*; but I have experience that it hath done more harme in heating the backe and sides than good, by the fastnesse of the Ligature. Neither doe I thinke it possible to make any Ligature of that kinde so firme as the ordinary Trusses are, especially if wee would use the backe and shoulder band to our Trusses, which I see few doe.

Where-

Wherefore my Counsell is, that men thus affected, resort to such Chirurgians as make their trusses themselves, and can fit them precisely. I have exhibited two figures of them hereunder.



The figure of a man broken on one side, together with his Trusse, whose boulder hath three swelling inequalities, two in the upper part, and one in the neather, and betwixt them somewhat hollowed, that it may not lye too hard upon the share bone. This will serve when the gut or the kell falls into the groyne.

A, A *Fascia* or band that goes over the shoulder, and is fastned behind and before to the girdle of the Trusse to keepe it in due place.

B, The girdle or Trusse.

C, The cavity of the Boulder in the midst of the swelling inequalities where it is better stuffed.

But if a man be bursten on both sides of the Groyne, which is a thing not very unusall, then the Girdle is made like the former, but there must be two Boulders, or at least a Boulder fitted for both sides, having a hole through it, whereat the Yard may issue; the fashion of it is such.

A

*A figure of a man burst on both sides; together with the fashion of a Trusse, with a double Boulster, and a hole in the middest for the Yard; the inside of the boulster must be like that before descri-
bed.*



When

J. R. F.

When the excrements fill the gut which falleth downe into the Cod, and so the gut cannot be issued backe by the rupture by which it fell, *Pareus* hath devised a refuge in that last extremity: An Instrument to cut the Cod, and so the *Peritoneum* larger than the rupture, that so the gut with the excrement may be returned up againe. But this may be a helpe in a deplorate case, and needes a hand more curious than stands in need of my helpe to direct, and therefore I passe it by. The perforating of the *scrotum* in a water Tumor about the Cod, or in the Navell, are easie operations, I will not stand upon them.

There is also another tricke to cure a tupture, by giving the fine powder of a Load-stone in Water-gruell, or the like inwardly, and strewing the filings of iron upon the place tumified; but looke for this in *Pareus Lib. 7. Cap. 15*. But he tooke the manner of the Cure upon trust.

CHAP. VI.

Of the Golden Ligature or Golden Punch as they call it.



Here is another way of curing the Rupture, or Relaxation of the processe of the *Peritoneum* by incision, in which a man is alwayes castrated, because the *Spermaticke* vessell issues through the sayd processe or production, and this way beside the castration, is also very dangerous; because oftentimes great fluxes of blood follow, and sometimes the parts Gangrenate; beside, the dissection of a branch of a Nerve of the sixt conjugation which is transmitted to the Testicles; ad hereto inflammations, convulsions, and other like fearefull symptoms which follow this castration, and commonly death also. All which to prevent the Chirurgians have invented a quaint way which they call the golden Punch or Ligature, because it is done with threds or wyre of gold. But *Pareus* likes better to doe it with Lead, and to other manners of Administrations preferres this which I shall now prescribe unto you, because the Lead hee uses, he afterwards takes away, whereas the golden wyre must bee left within when the wound is healed.

Lay

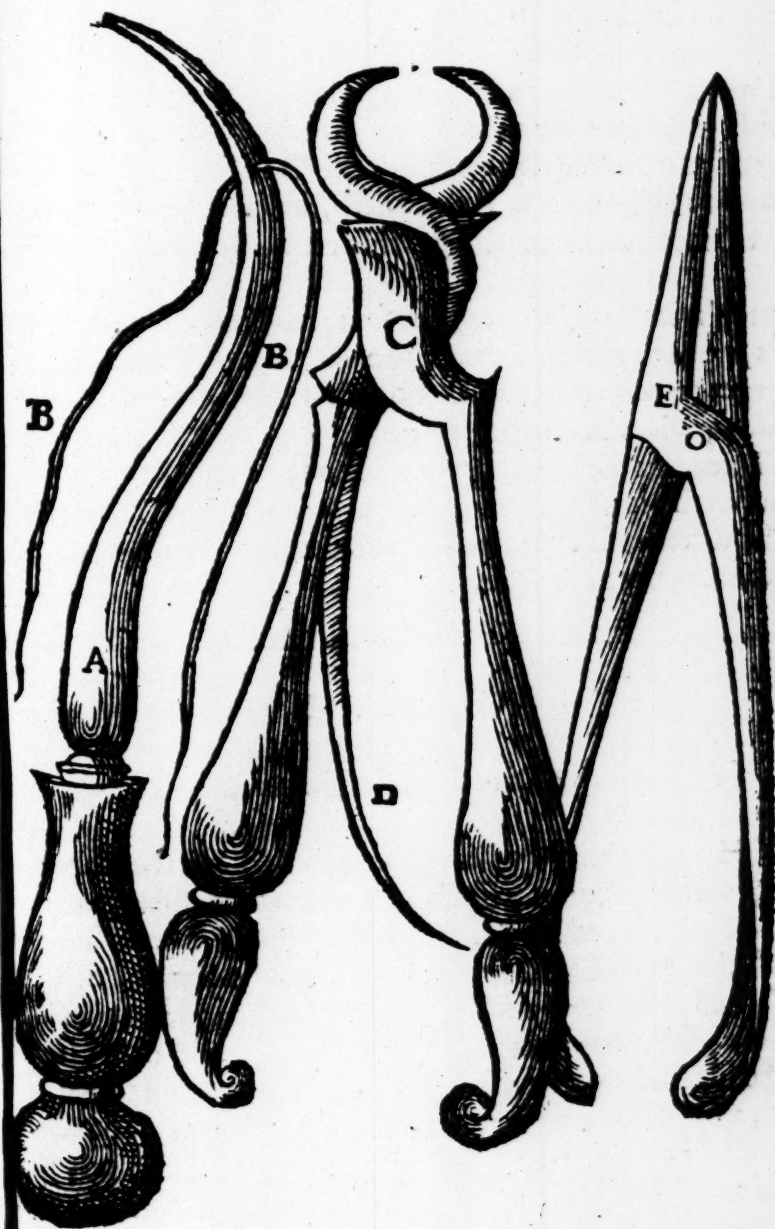
Lay the Patient with his thighes somewhat high, and his head somewhat low. Then divide the skin a little above the *Shart-bone*, where the Tumor is, as farre as the proceſſe of the *Peritoneum*, which with a Probe about the bigneſſe of a Goose quill, inſinuated into the wound, and ſtrained upward, they carefully ſever from the fibrous and nervous particles which cleave unto it, as alſo from the *Spermatieall veſſell*, and the *Cremaster muſcle* of the teſticle. When they have thus ſeparated the proceſſe, they convey under it a ſmall wyre of Lead, and whip it once about the proceſſe as farre as they conceive it is too much relaxed, but leaving the *Spermatieall veſſels* free. The ends of the wyre with a paire of ſmall Pincers, or Mallets made for the purpoſe, they ſtaine together and twine; neither too looſely, leaſt they leave a way for the kell or gut to fall downe againe; nor too hard, leſt they intercept the paſſage of the ſpirits, and of nourishment from the parts thereunder, and ſo they Gangrenate. The very ends of the wyre they ſuffer to hang out at the wound. When that contraction of the *Peritoneum* is in time (put caſe in 12 or 15 dayes) growne callous, then they gently untwine the heads of the wyre of Lead, and looſening it by degrees draw it away, and then heale up the wound. The figures of all the Inſtruments for the performance of this operation, be hereafter delineated; even the crooked needle with the thred in it, if the Chirurgion would worke after that manner, and the Pincers to crop off the golden wyre, if he would doe it after the ſecond manner; as alſo the Mallets to twine the Lead, if he will performe his worke the third way, which I have deſcribed onely for brevity ſake, and referre the Chirurgianto *Pareus* for the reſt, in the ſixteenth Chapter of his ſeventh booke.

A, Shewes the crooked needle with a hole neere the end, through which the thred or wyre of gold is drawne.

B, The wyre or thred it selfe.

C, The Pincers to crop off the wyre.

E, The Mullet which wreathes the ends of the wyre in compasse.



These

There is another way to doe this worke with a Cansticke, pretended to be safer and easier than the former, but I doe not conceive it to be so, and therefore I passe it by. One thing onely I thinke fit to adde, by way of caution, because I my selfe had a very late experience of the like case. A child had a rupture, (as was thought) and for that infirmity had a Trusse made, and wore it a yeere or more, at length upon further disquisition. I found that there was but one Testicle in the Cod. The other was not descended, but lay in the flanke, and was mistaken for a Rupture, the Trusse being removed, and the childe now growne to be about seven yeeres old, the Testicles descended into the *scrotum*, and the Tumor in the flanke vanished. Such an experiment *Pareus* hath, and truly it was his experiment that ledde mee to finde this error committed in this childe.

To particularize concerning the severall sorts of Ruptures and their Cures, were to entertaine you too long in an unfit place; yet I will not forget to remember with honour that Handy Chirurgion Master *Gillam*, who in a Patient of mine, cured a great *Hydrocel* or watery Tumor in the Cod, never using any Seton, haire, needle or silke, but with his Lancet divided the *scrotum*, and the pellicle wherein the water was contained, and let it out, and healed it againe, after which it never grew.

CHAP. VII.

Of five kindes of sutures.



He next thing I will intreat of, shall bee the manner of making sutures, or seames whereby Chirurgians use to sew up wounds, when they finde it necessary, and that is when the sides of the wound cannot be fitly joined together by a ligature or swathband, as in most transverse wounds it happeneth, because the flesh and other similar parts being dissected overthwart, flye and are contracted toward the whole part, and so make a greater separation; whereas if the wound be lengthwise, the separation of the part is not so great, but that the ligature may unite them againe. In which operation it is generall

rally to be observed: First, that there be no *heterogeny* left in the wound, no peece of the weapon, or the like. Next, that the future be immediately made after the wound is given, or as soone as may be; and againe, that the deeper the wound is into the flesh, the more flesh be also taken up with the needle, otherwise if the surface onely be sewed, the flesh underneath the future which is wounded, will turne into quitture, and apostemate into a cave or hollow Ulcer.

There are five kinds of sutures.

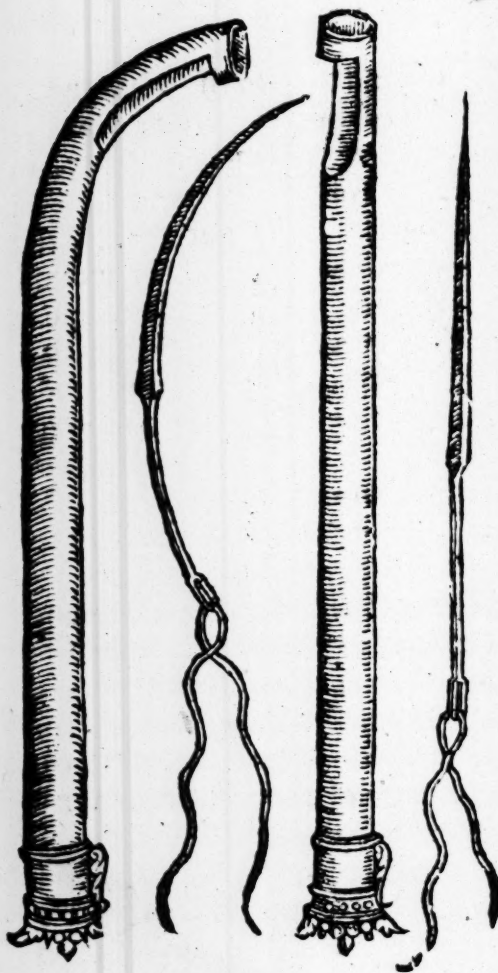
The first used in fleshy parts, not fit to bee swathed, is after this manner.

The needle must be long and slender, and toward the point three-square, like a Glovers needle, for so it will pierce better; the eye somewhat hollowed that the thred may bee hidden, as it were, in the gutter of it, and so it will more easily follow the needle. You must also prepare a silver quill, with a window cut out toward the end, whose whole side you shall place against the lip of the wound which you meane to pierce with the needle, as well too keepe it steady and firme against the force of the needle, as also that by that window, you may perceive when the needle hath pierced so much of the skinne and flesh as you desire, and through it may also draw the needle and his thread without shaking or mooving the lips of the wound. When the wound is stitched up, tye a knot upon the thred, as neere the skinne as you can, and cut off the rest that it sticke not to your Emplaisters.

But in the stitching you must observe, that if the wound bee any thing large, you must take the first stitch about the middest of the wound, and the second in the midway betweene the first stitch and the end of the wound, and the third answerable to the second, for betwixt every stitch there should be above halfe an inch distance. Neither must you draw the lips of the wound close together with your stitches, but leave a distance betwixt, that out of that distance the quitture may vent it selfe as it groweth, for otherwise it will not onely cause paine and inflammation, but so tumifie, that either the stitch or the thred, or both, will breake. Observe also that in taking up the skinne with the needle, you take not up too much flesh with it, for that will increase the paine and inflammation, and make the Cicatrice or scarre more deformed. But have due regard

to the depth of the wound, and the shallower it is, take up lesse flesh, the deeper more. Yea, sometimes the wound in fleshy and brawny parts will be so deepe, that it will be necessary to provide a crooked needle, and a crooked quill or Canule, to performe the worke, and therefore you have hereunder described of both sorts as well straight as crooked, for severall uses.

A type of the Quills and Needles required for the making of a Seame or Suture.



Observe by the way, that the silke thred waxed, is to be preferred before the thred of Line: and *Blondus* gives a good reason for it, for it will not so soone rot as the other.

The second kinde of Seame or Suture, is like that of Glovers, or that of the Skinners in sewing their Skinnes together. And it is used when the entrals are wounded, lest the excrement should issue out. I doe not deny but that it is possible such a cure may be wrought, but how hard it is to come to them, to doe the worke, and how dangerous after it is done, no man doubteth; yet any thing almost may be attempted to save life, if it may be, and nature sometimes doth incourage us to that which Art would thinke and leave as desperate.

The third kinde of Seame, is that which Chirugiaps use in the Cure of the Flax-lip, that is when

when the upper lip in the middest, is separated the one halfe from the other, and that from the birth, as it hapneth many times. They use the same Suture also when the lip is so wounded by accident, also in maine deepe wounds of the flesh, whose lips are farre distant. The needles (for they must be divers, sometimes many) must bee triangular or foure-square, almost throughout the length, and the thred well waxed that it breake not. That needle (if one stitch will serve) must be thrust through both sides of the wound or breach, and take up all the flesh of both lips, and there sticke halfe the needle at one lip of the wound, or breach, and halfe at the other; and in the same manner, another short needle (as the place will beare) must be thrust in the middest, crosse the former, and under the flesh as the former is. Then the thred which was in the eye of the first and longest needle, must be strayned crosse about all the foure ends of the two needles, seaven or eight times, or more, to hold the lips of the wound or breach firmly together till the union be perfected, and then the needles must be taken away, and the wounds they make healed according to Art. But if it bee a Hare-lip that was a fault of Conformation, the skin on both sides of the division must first be cut away, otherwise the sides will not unite. The figure of this kinde of Seame you have hereunder expressed.

The forme of the Suture for the Cloven or Hare-lip, together with the needle and thred rowled about them.



The fourth kind of Suture is called by a proper name *Gastrographia*: and is proper to the lower Belly, when the muscles of of the *Abdomen* and the *Peritoneum*, are namely wounded; In so much that some of the entrals sometimes fall out, but the *Omentum* alwayes, at the least a part of it. If the wound passe no further than to the *Peritoneum*, it may bee cured after the ordinary way of curing simple wounds: but if the *Peritoneum* be wounded, then the worke must be performed

med after this manner. First with your needle take up the *Peritoneum* alone, for example, on the right side of the wound, (for you may begin on which you please) and passing by the left side of the *Peritoneum*, take up the flesh of the muscle, and the skinne with it on the left side. Then take up the left side of the *Peritoneum*, and passing by his right side, take up the right side of the muscle and skin. Then take up the right side of the *Peritoneum*, and passing by his left side, take up the left side of the flesh and the skinne, and so sew your Seame crosse in and out, till the whole wound be seamed. The reason of this manner of seame is, because the *Peritoneum*, being a membranous part, and without blood, cannot re-unite, unlesse it have a bloody part joyned to it, which in this manner of suture it hath quite through the length of the wound. You must also observe, that this seame must be sewed as close as well may be throughout the length, till you come to the declive or lower part of the wound, there you must leave a stitch at least, both in the membrane and in the muscle, at which vent the *sanies* and matter may issue, till there be none left, and then it must be healed up with a *Cicatrice*. Observe also, that if any of the *omentum* issue out of the wound, it must not be reposed, but cut off; for that fat is foeculent, if it once take the ayre, or rather the ayre take it, it will putrefie. Also if any of the entrals issue at the wound, the Patient must be layd in such a position as they may best be reposed, and that must be done with great tendernesse and easinesse of hand, that the ayre come as little to them as may bee, and that they be not violated or shuffled in the reposition.

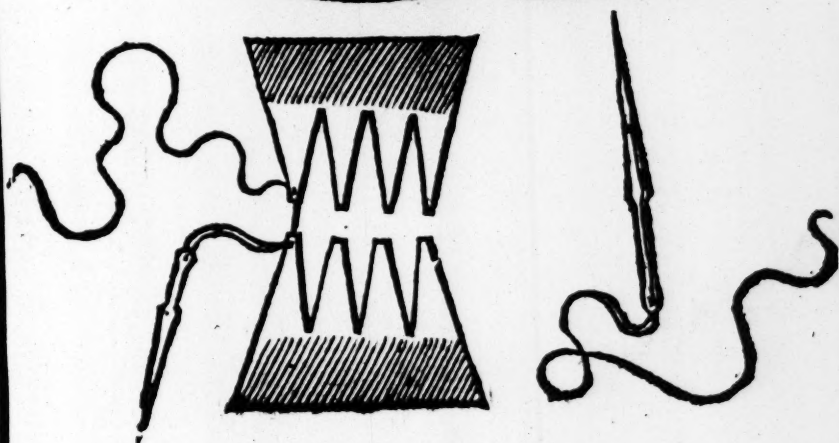
The fift kinde is called the dry Seame, which is used onely in wounds of the face, to avoyd scarres which will make the face deformed. For that is the market place, especially in women, to please whom Chirur-gians have devised this kinde of Suture.

According to the bignesse of the wound, you must cut out a paire of Indentures, of strong Cloath, in the forme hereunder described. These you shall spread with the following Medicine, or steepe them in it. *Recipe pulverum Mastich; sanguinis draconis, thuris, farina volatilis, Tragacantha contusa, gyps, picis, sarcocolle, ana dra. i. picis nigre scruples 2. grain 5. albumina ovorum quae sufficiant, fiat medicamentum.* These cloathes you shall lay upon the face, at the opposite lips of the wound, so that they may be distant the breadth of a finger, and suffer them to lye till they cleave strongly to the skinne of the face.

Then

Then with a needle and thread, straine the indented opposite corners together so hard, that the flesh (to which they will firmly cleave) may bee drawne together with them, and so bee reunited by such meanes as you shall finde to be fit. But be carefull with fit bands and tyes about the head to establish your worke, that it stirre not till you have brought it to perfection. The fashion of the Indentures and their application is hereunder expressed.

The figure of the dry Scame,



CHAP. VIII.

Of some offences of the Eyes.

EE spake last of the wounds of the face in the end of the last Chapter, wherefore here I will also prosecute some accidents which happen about the face also, and absolve what I have to say concerning it; yet so that I will meddle onely with such accidents as require the use of the Instruments I have to describe, to which in this small additament I tye my selfe.

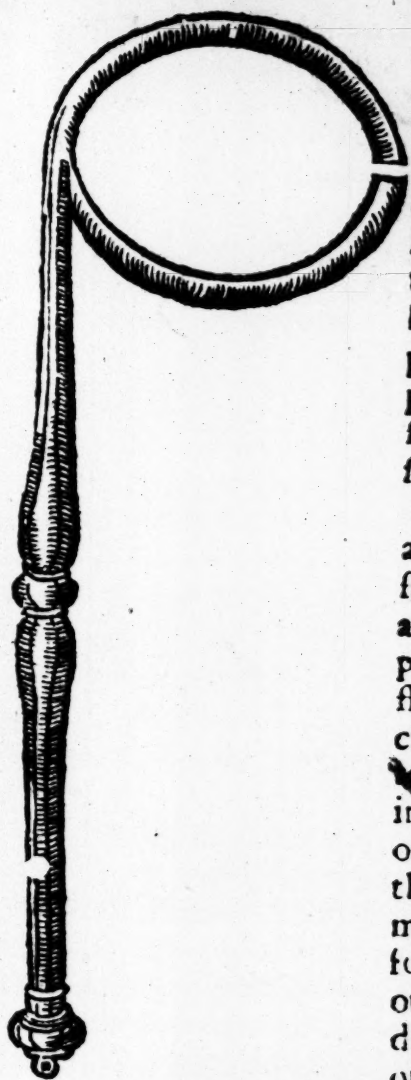
First therefore many small moles fall into the Eye which are sometimes hard to get out, and being sharpe, or otherwise of evill qualitie, breed an extreame and insufferable offence. If by turning the eyelid over the end of a *spatula*, you cannot finde that which offends, then you may use the Instrument hereunder described. You must insinuate it under the eye-lids, next to the white of the eye, and so separate the liddes as farre asunder as you can without too much violence, and withall, hold the eye steady, that with a paire of small Pincers you may pull out that which offends, which sometimes will be fast fixed, or adhere close to the membranes. This Instrument must be so artificially made, that according to the bignesse or smalnesse of the eye, or as you would have it extended or drawne in, it may be made wider or narrower, at your pleasure. This is the forme of it.

Againe

Againe, the Eyes are often vexed with sharpe and most importunate De- fluxions, so that sometimes the Horny coat of the Eye is broken therewith, and the very naturall humour of the Eye issueth out. To avoyd this mis- chiefe, wee are constrained to use the helpe of the *Seton*, which is often found to be a remedy (not in this disease onely, but in many others) and many exam- ples I could bring of it, if I did not purposely command my selfe to bee short as I may, I come therefore to de- scribe the use of the *Seton*.

Place the Patient upon a foot-stoole, and bow his head downe-ward, to stretch the skinne of his necke as much as you can. Then with your fingers se- parate the skinne, together with the fleshy pannicle under it, from the mus- cles of the necke; then set on the Tongues, so that the holes perforated in them, may stand up and downe, not overthwart the necke. Pinch him hard, that the paine of the tongues or pincers may take away the sence of that which followes. Have your probe ready three or foure square at the point, and imme- diately as bigge as a Goose or Swannes quill, crooked at the end, and red hot;

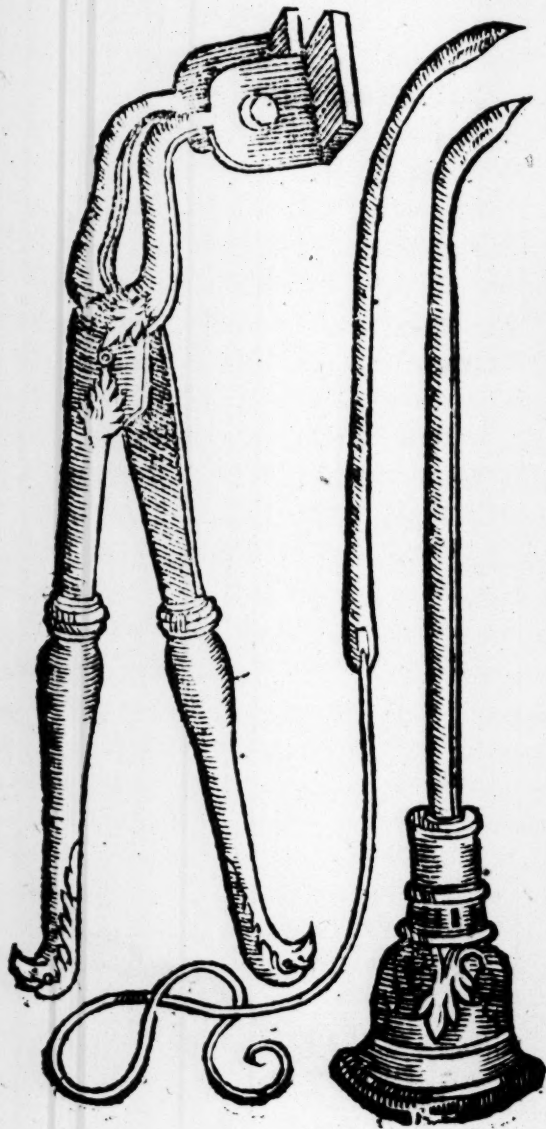
that probe you shall enter into one hole of the Pincers, and issue at the other; hold it in no longer than it hath made a good Eschar, then draw it out, and put in a needle made large for the purpose, with a thicke fourefold thred of Cotton-wool, or rather Sleeve silke somewhat twisted, and wet with the white of an Egge, and a little Juice or infusion of Roses mingled together. After that, cover the wound with double cloathes, wet in the same liquor, and binde it up. The next day annoint the necke with Oyle of Roses, and for a few dayes renew the double cloathes, moystned as before; but the



Seton or string which is in the wound, must bee gently drawne to and againe, and rubbed over with this following Medicine.

Recipe Terebinth. Veneta ounces 2. syr. ros. & de absynthio. ana drams 2. pulvis Ireos, diacridij, Agarici trochiscati & Rheiba ana gr. xv. incorporentur omnia simul & fiat medicamentum. And this must be used as long as you would keepe the wound open.

The Figures of the Pincers, Probe, and Needle, are here under expressed.



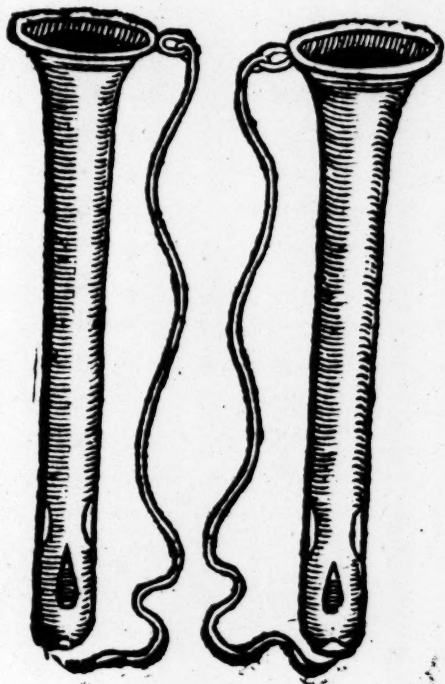
CHAP. IX.

Of some offences about
the Nose, and the
Eares.



He Nose as it is the chiefe beauty of the Face, if it be whole and proportionable; so if it bee violated or deformed, it disfigures the face most, and therefore the Poet calls the wounds of the Nose, *inhonesta vulnera*. As if they did dishonest a man. Yet because the Nose stands out upon the Face, and hath it selfe no defence, it is subject to more outward injuries than the rest of the parts about it. The upper part of it especially, because it is bony, is subject to be broken, which when it hap-

to pens, it may be thus amended. First, you shall frame or whittle a
 stick somewhat broad at the end, like a little *Spanula*, and whip it
 about with Tow, or with a Clout, which you shall put into the
 nostrils, and therewith restore the bones to their right places and
 figure. Then with stipes or cloathes moystned with an *Adstringent*
 Medicine of Masticke, bole *Armenia*, *sanguis draconis*, and burnt
 Alume, made up with the whites of Egges, you shall cover the
 sides of the Nose, for that will establish them, and then binde it up
 with a fit Ligature, not too hard, least you make the Nose crooked
 and sadled, which beside the inconveniences it brings with it, will
 be a great disfiguring to the Face. After you shall provide two small
 pipes, or tunnels, not exactly round, but somewhat depressed with
 holes in the end, and about the end; by which the *Sanies* may issue,
 and also the breath may be drawne in and returned. At the outward
 end, let them be a little more compasse, and a small ring fastned to
 them to tye a string unto, which string you shall so fasten about the
 Night-Cap, that the Tunnels may be held within the nostrils. These
 will containe the bones of the Nose in their due position, till the
 cure be perfected. The figure of them you have hereunder expres-
 sed.



But if a part of the Nose be
 cut, and there be any quanti-
 ty of flesh remaining, where-
 by the wounded part may re-
 ceive life and nourishment, it
 will be good to sew it up; o-
 therwise the wound cannot
 be restored, unlesse it bee by
 that quaint device of taking
 a new nose out of the skinn
 of the Arme, with the de-
 scription of which operation
 I will not trouble my selfe
 nor you at this time; or a new
 nose counterfeited as *Pareus*
 teaches.

For the cares if the Carti-
 lages be cut away, there is no
 hope

hope of recovering them; but if the Cartilage be so cut, that some part of it hang by the skinne, it may be sewed up againe; yet beware you pierce not the Cartilage with your needle, for then it will gangrenate but onely the skinne, and as much of the flesh as you can take hold of which compasses the Cartilage. The rest of the Cure must be accomplished with Stupes, and deligations and such medicines as may prevent inflammation and other accidents. But beside, beware that you defend well the hole of the Eare with a Sponge, least any thing get into it; for sometimes by such neglect, some small portion of flesh will get into it, whereby the hearing will be depraved, if not utterly on that side lost.

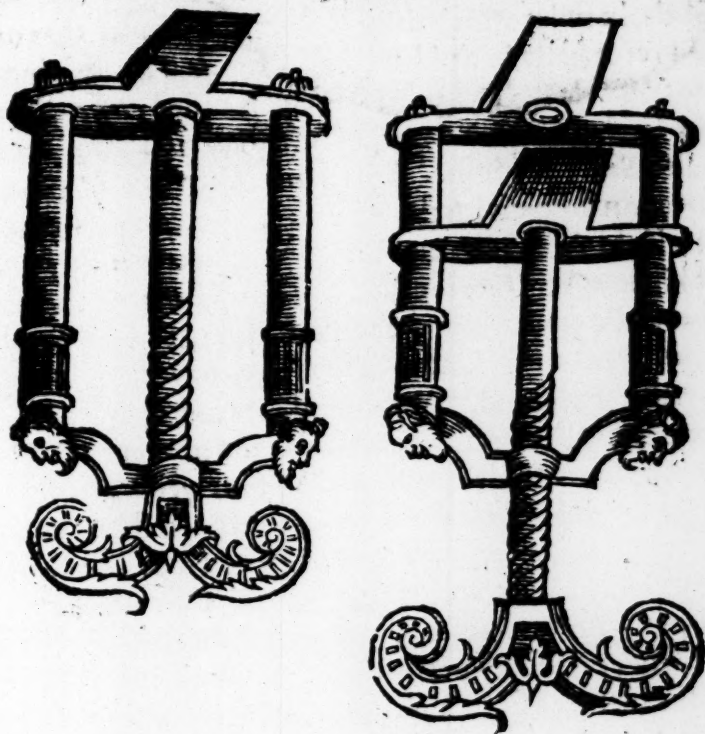
CHAP. X.

Of the Convulsion of the mouth.



Before I goe from the Face, I must admonish you the causes of Convulsions, being often about the head which is the originall of the sinewes, and the temporal muscle being neere upon the Lesion, whereof Convulsions doe often ensue; it is worth your care to know how to prevent the Convulsions of the mouth. For the Teeth sometimes in such a case be so closed, that it hath beene knowne the end of the tongue hath beene quite bitten off. To prevent which mischeefe, as also that the mouth may bee kept wide open to receive medicines fit for the cure of such a disease, the Chirurgians have invented an Instrument, which they call *Speculum oris*, whereby they can open the mouth, and part the Teeth wider and wider at their pleasure. But you must remember that when you perceive any beginning of a Convulsion of the jawes, yea, when you have reason to feare it will follow, if your Instrument be not at hand, put a stick, a *Spatula* or some such thing betweene the Teeth, to hold them so farre asunder that the tongue may not be violated, and that there may be a way open to enter in the *Speculum*, which it will be hard to doe, if the Teeth be quite set, as we say. Heere you have two of those Instruments delineated, the one close, the other dilated.

CHA



CHAP. XI.

Of the five sorts of Fractures of the head, and of the signes of a Fracture in generall.

HAVING done with the Face, we come to the Head, or rather to the Scull, which is subject to so many sorts of Fractures and Contusions, that it will take us up sometime to distinguish them into their kinds: which yet I will doe as briefly, as I can, and much more briefly than a businesse of so great consequence should be handled, if I did not tye my selfe within so narrow cancels as I have before prefixed. There be therefore five kinds of Fractures of the Scull. The first is called *Fissura*, a Fissure, or Cleaving, such as in an earthen pot or glasse when they are crackt, and the cracke runnes along in it. The second is called *Contusio* or *Collisio*, a bruise of the scul, wherein there may be also a small dépression, but the bruise greeth on farther than the upper shell or table of the Scull; for the Scull consisteth throughout of two Tables

Table or Shels, betwixt which there is so much distance that one may be depressed (especially in children, and in womens heads) through the lower be not offended. The third fracture is called *Effractura* when the Table or Tables are both depressed and shattered into pieces. The fourth is called *Sedes* the Seate. This name *Hippocrates* gave it, because the weapon wherewith the blow was given, makes as it were a seate for it selfe in the Scull, and leaves his impression therein. The fift and last kinde of Fracture is called *Contra-fissura*, or the Counter fissure, because the cracke is in the opposite part, to that which received the blow. All these kindes of Fractures have some things common: especially the second, and the third, because they have also many observations and Instruments particular and proper to these severall kindes, I thinke fit to handle them particularly, yet with my accustomed brevity. But before I come to the particulars, it shall not be amisse in generall to give you the signes whereby you may know that there is a Fracture made. And these signes are of two sorts: some are such as doe perswade our reason, some convince our sense. The signes that may reasonably perswade us that there is a fracture made, are these. If a man fall from high upon a hard place, or if a hard and heavie body fall from high upon his head. If upon the blow he presently fall, but much more if he lye for a time deprived of speech, sight, and hearing; if the paine (after he comes to himselfe) be vehement and doe prelevare, so that he is constrained often to move his head to the part affected: if when he awakes out of his astonishment he fell into upon the blow; his minde or reason be not perfect but disturbed, his sight dimmed & his head remaine giddy, as it is in the *vertigo*; if blood upon the blow issue out at his eyes, nose, eares, or mouth, or finally if he vomit shortly after the stroke. The reasons why all these be signes of a Fracture, I must not here unfold, you must take my word for the present. You may also gesse shrewdly at a Fracture by the forme of the weapon, by the force wherewith the blow was given, if it were scene; if it were not scene, by the wrath or fury, or strength of him that gave it, if his head were bare and without defence when the stroke came, and if it were downeright and not sidelong.

All these and many other the like circumstances may leade a man that is vigilant, and hath as we say, his eyes in his head, to judge whether

her there be a Fracture committed or not, For although some of these accidents may happen without a Fracture, yet if many of them come together; especially of those I named last, they will put the case out of doubt.

Paulus Aegineta hath another way to know whether the skull be cracked or no: where the wound is, he removeth the scalpe and the *Pericranium* from the bone, and knockes it with an iron Probe, and if from that knocking there result a dull sound, such as a cracked Pitcher yields, then he takes it for granted that there is a Fissure; but surely to distinguish such a sound by such a meanes, I take to be very difficult. *Guido* conceits sounds better, and beside, junts the very place of the fracture, yea, the extent of it, if it prove true. Let the Patient hold the end of a small cord hard betwixt his foreteeth, and the Chirurgian the other end in his hand, and straine the cord hard, and then move as you would doe the string of an Instrument, and in the very stroke, saith he, the patient shall be admonished, where the Fracture or Fissure is, and the paine will make him point directly to the place. *Arenus* hath no faith to beleve this experiment, as having tried it often and never found any certainty in it. Thus much for the signes which may perswade our reason; there be others which will convince our sense, which we may see with our eyes, or feele with our hands, or with our Instruments which cannot deceive us. Among these is reckoned that of *Hippocrates* his observation, if the hayre stand upright and stiffe in the wound, if the Chirurgian can with his finger feele a roughnesse and inequality any thing sharpe in the wound under his finger, or a manifest depression of the Skull. If yet a man cannot finde the Fracture, he must make a decussate incision in the Scalpe, that is to say, he must cut it crosse, so as the incisions may meete in the midst of the place suspected, and lay the bone bare, and then if he cannot see the Fracture with his eye, he must grope after it with his Instrument. This Instrument must be neither too slender, nor too sharp, lest if it happen to sticke in any naturall inequalities of the Skull, it might deceive us; neither must it bee thicke and blunt, lest it might slide by and not offend at a small Fracture. If when this Instrument or Probe arrives at the bare bone, there bee nothing to bee felt but smooth and slippery equality, then there is no Fracture; but if the Probe meete with any roughnesse, especially not in the way of the Surface, then there is certainly a Fracture. Yet must the Chirurgian remember

member, that sometimes it may happen that there is a Fracture even the place of the Suture, and then it is hard to be discerned, unless be a very great Fracture, because the roughness of the Suture hides in which case *Hippocrates* himselfe confesses he was deceived. And beside, in some bodies the sutures are more close, in some more open in some more equall and smooth, in some more unequall and prominent. All these things the oculate Chirurgicalian must weigh in his mind and with them compare the reasonable signes before mentioned; and so doing, it is not likely he can be deceived. Thus much of the differences and signes of Fractures in favour of young Arts-men, though be beside my intention. Now I proceed to the particular sorts of Fractures.

CHAP. XII.

Of Fissures of the Scull, the first kinde of Fracture.



He first sort of Fracture of the Scull, is the Fissure, which when the Chirurgicalian shall know to bee committed, and yet the wound in the Scalpe is not large enough for him that he may dexterously apply himselfe to the cure of the Fissure, then he shall first shave off the haire as wide as he shall thinke fit, and with a Lancet or incision knife, divide the skin and *Pericranium* from the bone, in a three or foure cornered Incision that is, thus T, or thus X, and to that magnitude which hee shall assigne to himselfe; but yet he must be carefull as neere as he can to avoid the place of the sutures, and especially the Temples. Neither let him make any scruple thus to make way for his worke, for it is a little detriment to wound the skinne (though it prove there bee no great need of it) which he may easily heale up againe, than to be ignorant of the nature, kinde, and extent of a Fracture, for want of seeing his wound before him. This Incision he may make with a Lancet or Penknife as we call it, or an incision Knife, the figures whereof, though you have expressed before in the first Chapter, yet I have thought fit here againe to discipher.

But whereas I told you, that you must make your incision in the Scalpe cornered, you may provide that the wound which was made with the blow, may fall in as it may to make up the corners of your incision. Alwayes provide that your knife be sharpe, and your hand so heavy, that together with the hairy Scalpe, you divide also the *Pericranium*, and presently separate it cleane from the bone; for if it remaine upon the bone, and come afterward to be torne by the Trepan, being of exquisite sense and so neere of kinne to the *Dura mater*, that it is thought to be a production thereof, it will induce vehement Fevers and other Symptomes. Wherefore beginning at the inner corners where your incisions met, raise it up with such an Instrument as is hereunder delineated.

When

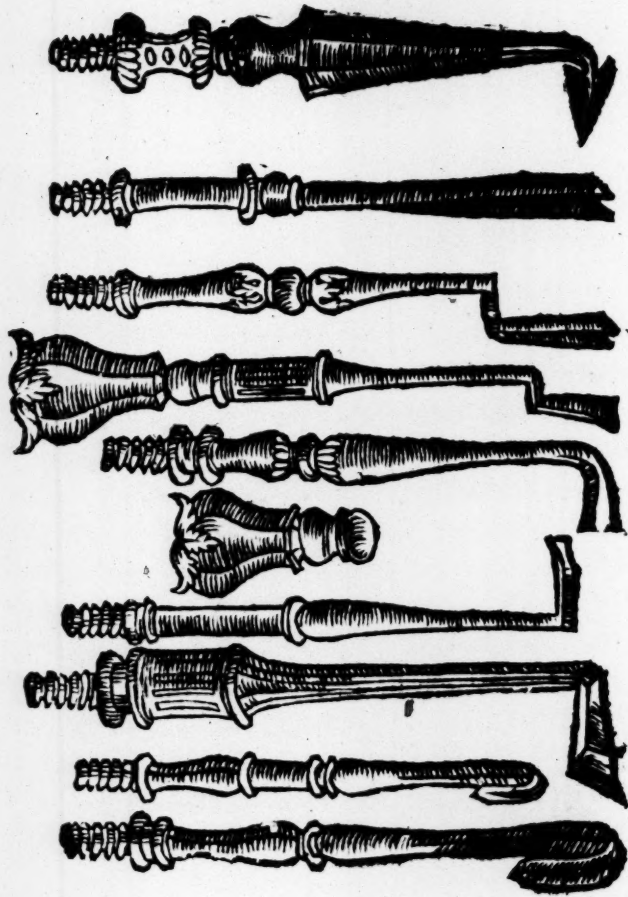




When the *Pericranium* is well separated, fill the whole wound with pledgets of fine Lint, to keepe the lips farther asunder, and above it apply remedies to stay the flux of blood, which if it cannot be stayed with medicines, and that you can finde some notable branch of a veine by which it issueth, enter a needle with a thred on the outside of the Scalpe, and returne it againe from the inside outward, so that the thred may crosse the vessell, and then with the two ends of the thred which are now on the outside of the scalpe, tye a knot as straight as you thinke fit, to twitch up the veine, which you would stanch: but betwixt the thred and Scalpe, you must enterpose a rowle or pledget of Lint for a bolster on both sides, that the straying of the knot may neither cut the flesh, nor offend the skinne, and breed more paine than is necessary; when you have so stanchd the blood, leave the head bolstered up. And such a stitch is sometimes of absolute necessity, as when an Artery is wounded, for then no restrictive or binding poulders or medicines would doe the feate. And we finde in dayly experience, that in outward parts, as well as in inward, wee shall light upon an Artery of some largenesse, where we did not dreame of it; so various is Nature many times in the diversifying of the vessells. At the next dressing (which would be next day) the Ligature need not be loosed, and yet it will be time for the

Chirurgian to resolve himselfe whether there be a Fracture or no, and of what kind it is. If he cannot finde the fracture, let him wet the bare bone with writing Ink, adding thereto a moment of oyle of roses, & if there be any chink or cleft in the bone, the Inke will pierce into it. The next dressing he shall carefully cleare the Inke from the bone, with Lint, and then with an Instrument which they call *Scalprum* or *Radula*, made of Steele, with a head like a compasse chefill, or like a broad Arrow head, or like a hooked Chefill returned somewhat at the edge, he shall scrape or scale the bone; and if he finde

that which he scrapes off to be blacke, it is a signe that there the Fissure is, because the Inke hath dyed the bone, and then hee shall continue scraping till the dust come white, without any tincture of the Inke, for then he may presume he is past the Fissure. Sometimes the Fissure will guide him to continue scraping or scaling till hee come to the very membrane or meninx: but if he would know before whether the Fissure be in both the Tables of the Scull, hee shall try it thus. Let the patient stop his nostrills and his mouth, that no breath issue out, and then let him strive to expire with all the power he hath; and if both the Tables be cloven, the Chirurgian shall perceive a bloody *Sanies* to issue at the cleft, for the ayre so pent will make the *meninx* to swell, and a frothy moysture will sweate out. In such case the scull shall be scraped or scaled to the very *meninx*, yet great care taken that that bee not touched. But if the Fissure be long, it shall not be alwayes necessary to follow the whole length of the Fissure with your scraper, for nature will restore it of her selfe, if there be way enough made for the *Sanies* to issue, whereby symptoms are avoyded, and the corruption also of the bone. Within three dayes this worke shall be performed; yet if it happen that the Chirurgian be called later, he shall doe well indeed to tell the standers by of the danger (for most perish who are long neglected) but yet he shall apply himselfe to his worke, as if he had beene sooner called, because God and Nature doe often assist a diligent hand beyond expectation. But observe that in Winter there is lesse danger of delay than in Summer, because the parts are in Summer more subject to inflammation than they are in Winter. You have hereby divers of these Instruments expressed of severall fashions, together with the handle by it selfe (for one handle will serve them all) whereinto the Instruments for more steadinesse must be screwed.



These two following Instruments will serve for the scaling of greater bones. Thus much of a simple Fissure.

CHAP.

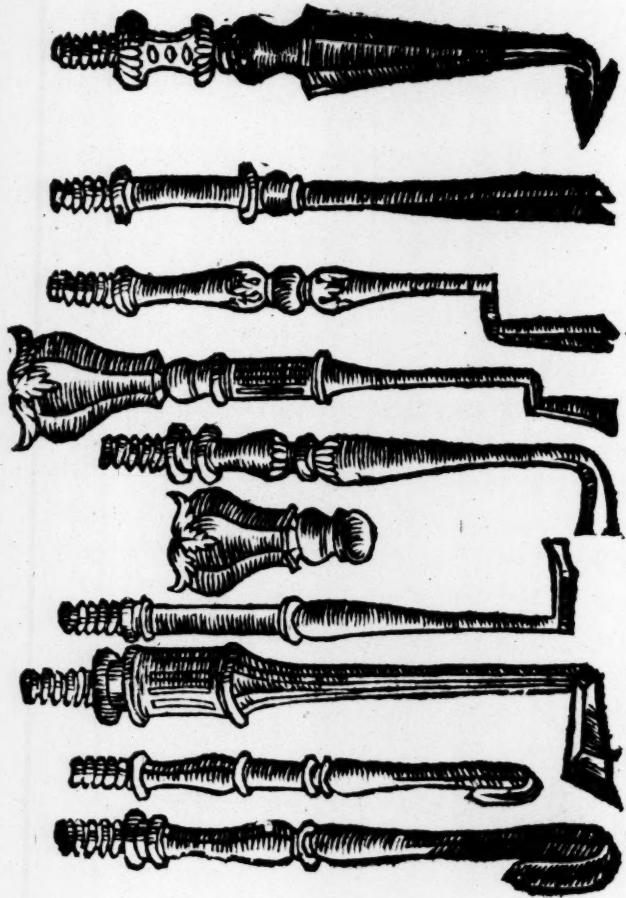
CHAP. XIII.

Of Contusions of the Scull, the second kind of Fracture.



Contusion, which is the second sort of Fracture of the Scull, sometimes hapneth with a breaking of the skinne, sometimes without. It happens without, when the Instrument wherewith the violence is offered, is obtuse and equall; Yet nevertheless there happens an *Ecchymosis* upon it, that is, an effusion of blood gathered under the Scalpe, in the place of the Contusion. If that effusion of blood be small, it may by fit medicines be discussed; but if it be great, so that the Scalpe rise from the scull, it must be vented and purged by incision: Neither after must you use suppurating medicines, as in a fleshy part you should doe, because all moyst things are e-

nemies to the bones. This Contusion happeneth very often to children, who cannot hold their feet; and beside, if they be metled, they are very busie, and get falls, and the scalpe of their heads being soft, collects much such like serous and clodded blood. After the Incision and evacuation of this serous blood made by gentle Compression, you shall finish the cure (if there bee no Fracture) with drying medicines. But if upon a great contusion the scull bee depressed like the print of a bruse in a brasie or Pewter-pot, so that you may feele the dint with your finger, you may expect a little (if the dint be not great) whether it will rise againe of it selfe, as it will doe in the moyst heads of Children, women, and such as are phlegmaticke; but if it doe not rise, you shall set on a Cupping-glasse



These two following Instruments will serve for the scaling of greater bones. Thus much of a simple Fissure.

CHAP

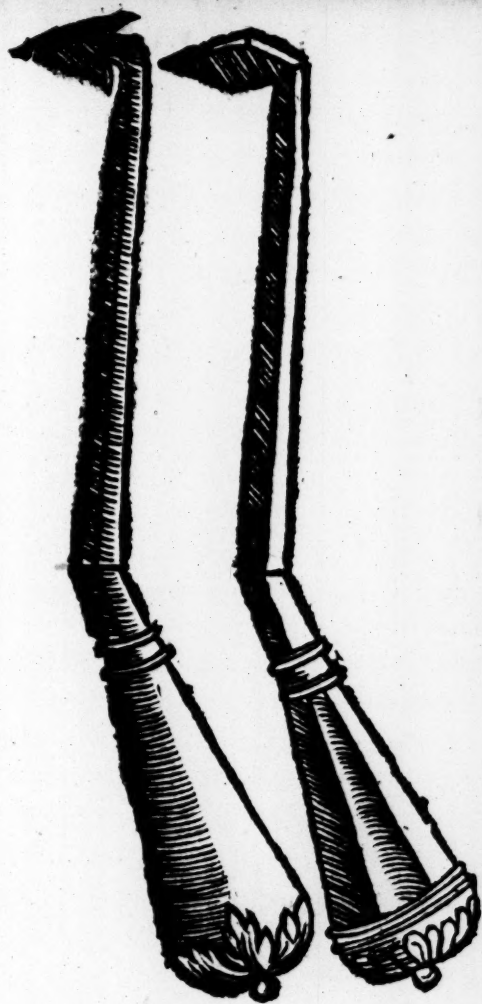
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CHAP. XIII.

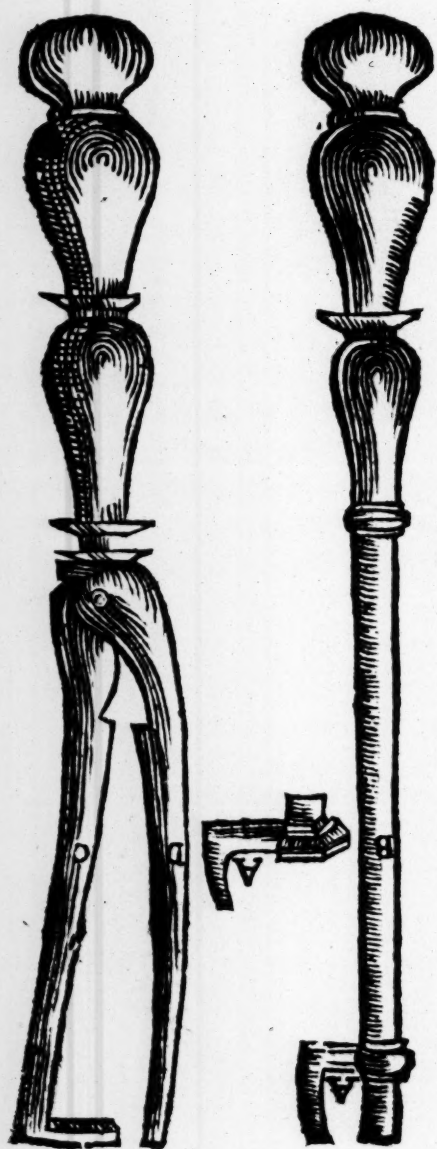
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With much haste, and command the Patient that he stop his Nose and mouth, and then force his breath upward; for by these means the depression may rise; if not, you must make Incision to the bone, and fasten upon it a Wimple or Piercer with a screw, and therewith draw the bone upward, till it be in his owne place, as the Coopers use to raise their vessels when they are sunke too much downward. But if the bone be so thicke or strong that the Wimple will not retract it, then you must perforate the scull in the center of the depression, and use the Lever hereunder deciphered.



A, Shewes the point or tongue of the *Levator*, which must be obtuse or blunt, that where it is insinuated as far under the Fracture as the *meninx*, it may not offend it.

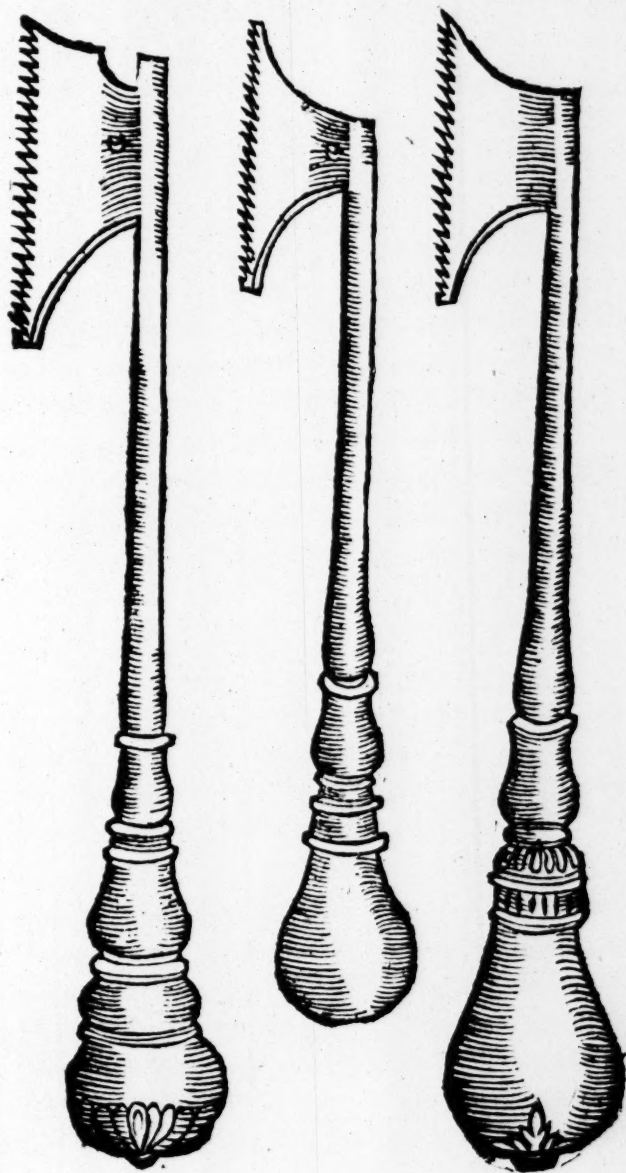
B, The body or scale of the *Levator*, which must be fouresquare that the tongue fastned in it may be steady. The end of this scale must rest upon the sound bone, that it may rest the firmer. The use of it is, That when the point or tongue is under the depressed bone, lifting the haft or handle upward, the bone depressed may be heaved up.

C, Shewes the first arme of another *Levator*, whose hooked end is by degrees insinuated under the depressed bone.

D, The second arme of this *Levator*, which must rest upon the sound bone, to assist the first in heaving up the depression: but in the use of this second *Levator*, you must

must depreſſe the haſt or handle, for ſo his firſt arme raiſes up the depreſſed bone, whereas the handle of the firſt *Leuator* muſt be lifted upward as farre as is neede to raiſe up the bone depreſſed.

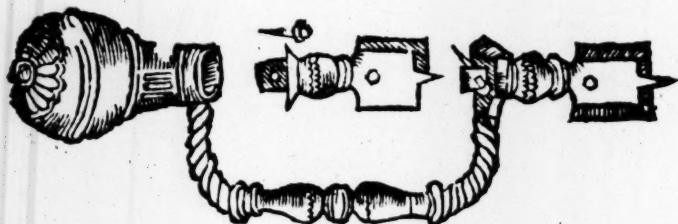
But if it happen that the bone be fractured and depreſſed on one ſide onely, that thou mayſt raiſe that ſide and alſo make way to vent the *Sanies* or *ichorous* matter there under contained, thou mayeſt



uſe ſmall Sawes, ſuch as are here deſcribed, to deuide the ſkull, and cut off without compreſſion, ſo much of the bone as ſhall bee needfull without danger of preſſing downe the broken part of the bone upon the *meninx*, from whence much miſchiefe might ariſe.

But if by ſuch ſignes as have beene before related, or by any other, you ſhall bee convinced in your judgment, that the Conuulſion is onely in the upper Table of the Skull: You ſhall ſafely take out that depreſſed part with a ſmall Trepan, whole handle is like the handle of a loynes Piercer, but the
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Bit must like the Instrument whereby those that make Button-moulds doe turne them out of the wood. The handle and the Bit are here both expressed.



CHAP. XIII.

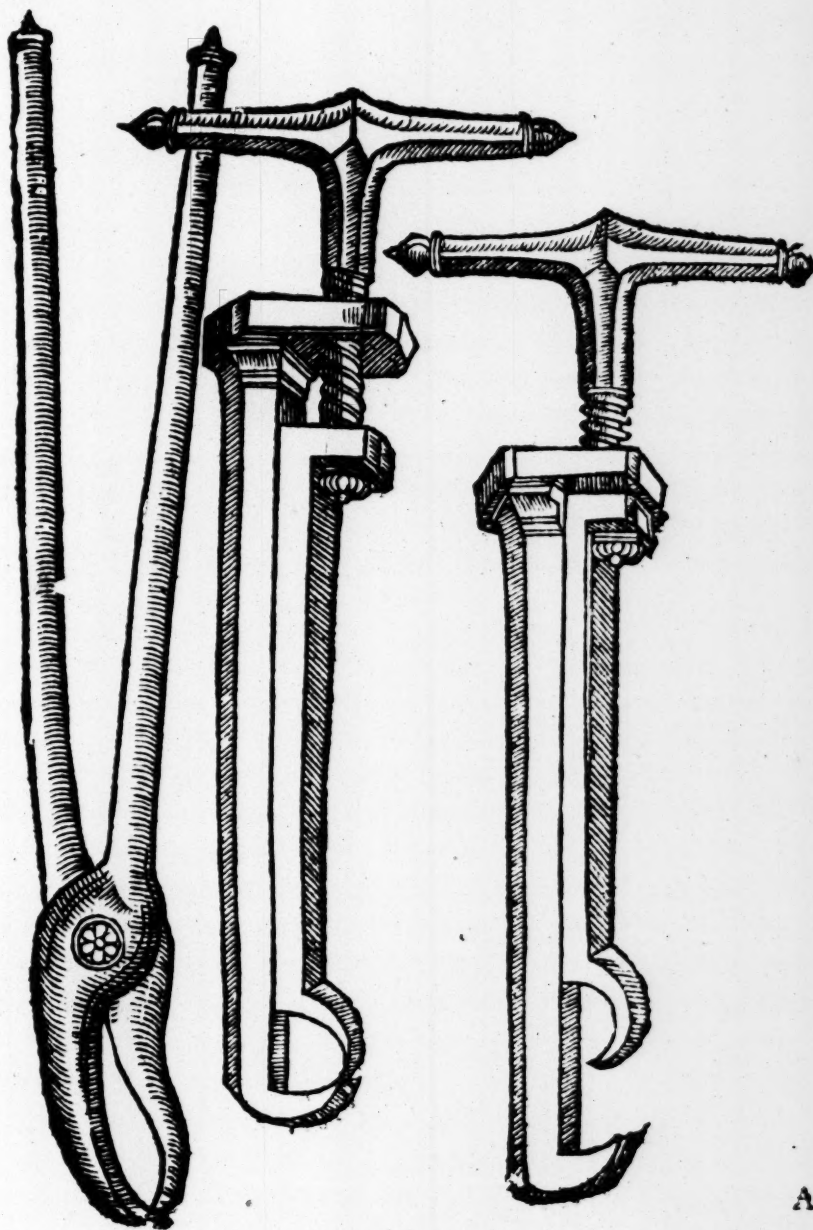
Of an Effrature of the Scull, the third kind of Fracture.



The third kinde of Fracture is called *Effractura*, that is, when upon a vehement blow the Scull is not dinted onely, but sinkes, and the Table or Tables are broken asunder, for so much the word signifies, and sometimes into many peeces; seaven peeces of the Scull I saw taken out of a Childs head in the *Old-Iurie*, which the wheele of a Cart pressed against a wall, yet he recovered. And because in this kinde of Fracture, the bones being separated and loose, may be taken out without trepaning, Chirurgians have prepared small *Levators*, whose formes need not be expressed they are so common; they be crooked, turned up widely at each end contrary-ways; and a little broader at the end, as it were spooned, which spoone also is rugged and unequall, to fasten better under the splinter which you should raise up and loosen from the membrane; but on the embowed side they must be very smooth, for that side touches the membrane in the operation, and leanes a little upon it.

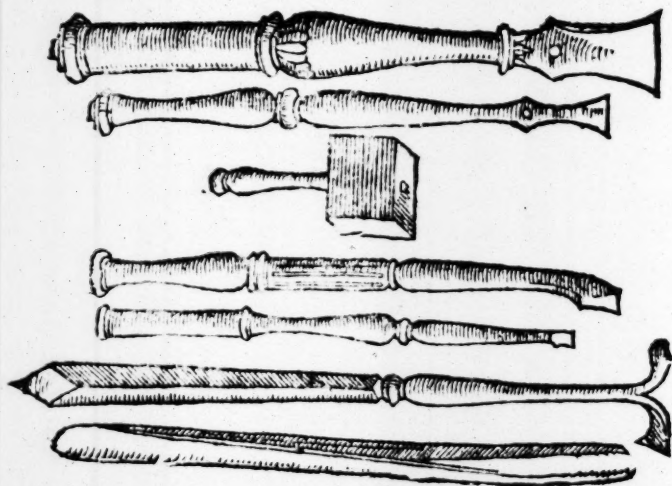
But there must be great care had, least in taking away these shreds or splinters, we offend not the membrane, which often times is compressed, sometimes wounded by them: sometimes it happens that these splinters runne under the Fracture so farre, as they cannot be gotten out unlesse it be enlarged. In such a case, if there be space enough to get one of these paire of tongues or pincers under the bone, you may snap off so much of it as will discover the splinter.

and make way for the drawing it out, better a great deale, and with more ease and security to the Patient, than you can use the Tripan or Trepan. Beside, the businesse hath not so much circumstance, but may be suddenly done. Now we know to doe a worke suddenly and securely, is of great commendation. The fashion of these tongues and pincers, or both, are hereunder described very accurately.



And

And because in these Fractures, not onely for the removing and splints, but also for the smoothing, and making of the edges of broken bones, and plaining them, there is use of diverse sorts of Chisells, Pincers and the like, as also of a Mallet; you have many fashions of them here described, that you may take your choyce, as you shall finde occasion to require.



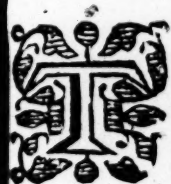
For it must be considered, that as much as is possible, the Chyrurgian ought to avoyd, not onely the hazzard, but even the offence of his Patient; and if he can take up and separate the broken bones with a simple *Levator*, let him neither use the Pincers nor the Tripan. If the Pincers will serve let him not use the Tripan, for it hath beene observed, that in using the Tripan sometimes, where there hath beene no necessary use of it, so much of the Scull which was but split, hath beene loosned, as hath induced terrible consequences, which might haply have beene avoyded, if that hard course had not beene taken; for as I have said before, Nature many times takes upon her selfe and perfects such cures, as if an Artist should meddle with, he would spoyle all: For it is not for nothing that God hath prepared that *Medullium*, a bloody and alimentary substance betweene the Tables of the Scull, but that by it as by marrow baked into a callous substance, the divisions of these bones might be united. Wherefore my counsell is that the Chyrurgian should be above all things careful that there be way made for the evacuation of the *Sanes* or corrupt matter in every Fissure and Fracture, but otherwise, that he strive not too much to bare the meninx, nor in

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decide more than he must of necessity doe, provided that he leave no inequality or asperity of the bone to grate it.

CHAP. XV.

Of the Seate, the fourth kinde of Fracture.



He fourth kind of Fracture is that, in which the weapon so sits in the Scull, that the Scull carries the print of it, neither longer nor shorter, and therefore *Hippocrates* (a happy Author, not onely of things, but of names also) calls it *ἵσα*, *Sedes* the seat; for as a Hare settles in her Forme, so the weapon settles in the Scull, and leaves his impression in it, *ad amussim*. The seates are of divers kindes, some superficially; some are impressed to the *medetullium*, some depresse both the Tables: some are long, some short, some broad, some narrow, according to the forme of the weapon, and the force which was added to it. The Instruments whereby this kinde of Fracture is relieved, are the same we have spoken of before, and those only excepting the Trepan of which we shall intreat by and by. In the meane time it is to be noted and diligently marked: That if it happen that a part of the Scull be absolutely broken or cut from the rest, yet if it hang to the *Pericranium* and the Scalpe, it must not be pulled from them and throwne away as unprofitable, but may be reposed againe in his owne place, and Nature will unite it to the bone of the Scull, by the interposition of a *Callus*, as she unites the skin by a *Cicatrice*. This *Celsus* observes, and *Pareus* tells a Tale of a Captaine, a great part of whose fore-head-bone, was so sliced with a sword, that it hung onely by the *Pericranium* and the musculous skin of the forehead, and fell upon his eyes, that the meninx might be seene bare. He cleaved away the blood from the meninx, and returned the bone into his place, and established it in the upper part, with a seame of three stiches to the scalpe, and filled up the rest of the sides of the wound with pledgets of Lint, that there might be way left for the *sanies* to vent it selfe, and the bone that was cut fastned it selfe to the rest of the Scull, and the man recovered.



Finally it happeneth sometimes that there is a Fissure in the opposite, or contrary part of the Scull, to that which receiveth the blow; so that if the blow were upon the right side, the left is cloven, and on the contrary. This kinde of Fissure is by so much the more dangerous, by how much it is harder to finde. *Paulus Aegineta* laughs at *Hippocrates* for making mention of it, and his reason is, because though an empty glasse or pot, may bee after that manner countercloven, yet the hard and full Scull cannot, as he conceits. But *Pareus* avoucheth that he hath seene it, and calls it *Resonitus* and *Contrafissura*: but withall saith, that it happeneth when the sutures of the Scull are obliterated, and the scull growne to be all one bone, or at least when the sutures are very close. Moreover, he is of opinion, that *Hippocrates* meant also that the same bone of the scull may receive the stroake in one part, and be fractured in the opposite part; although the sutures be naturall, and as they ought to be: but you must conceive that the part opposite to the blow in the same bone, may be understood two wayes. First, when the fracture is in the same superficies of the bone whereupon the blow did light, as if the blow did alight upon that part of the *bregma*, which is next the *Lambdall* future, and the fissure happen in the part of the same *bregma* which is next the *Coronall* future. Secondly, when the upper superficies or Table of the bone received the blow, and the nether table of the same bone, is cloven; of which kinde *Pareus* tels a story of a Knight who belonging to the troope of Horse, under Duke *Stephanus*. His discourse you may see in the eighth chapter of the ninth booke. The cure of this kinde of Fracture *Hippocrates* himselfe, who first wrote of it, pretermitted, because he could not conceive how it should be discovered, and therefore for the most part it proved mortall. But *Pareus* would not have it so neglected, but where by conjecturall and the rationall signes before described, it may well be suspected, he would have the haire of the head shaved close, and a plaister put on, made of Tarre, Pitch, Waxe, Turpentine, *Irish* and Mastich duly mingled. If upon the use of this plaister any part of the skinne become moyst, soft and tumified, under that he imagineth the Fissure is, especially if the Patient unawares, as it were

without manifest sense of pain doe lay his hand upon that part. In such a case, & where some of the signes of a Fracture before mentioned doe second his conceit, he calls in the helpe of a learned Physician, and then fore-telling the danger that the Patient is in, he sets Trepan upon the scull. For there are foure conditions of a Fracture, wherein the Chirurgian may easily be deceived, and thinke there is none, when indeed there is a Fracture. The first, when the scull is lightly depressed, and shortly riseth againe into the due figure. The second, when the fissure is small and hairie, like the rift in a glasse which yet will hold water. The third, when the lower Table is fractured, the upper remaining sound, atleast to the sight. And lastly in this kind of fracture, which we call a counter-fissure or *Re-Conitus*.

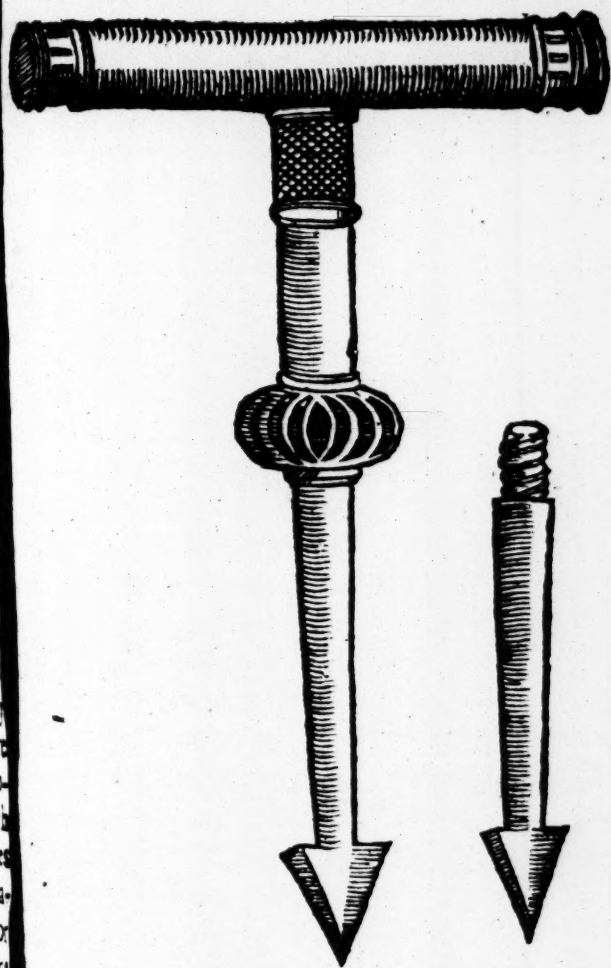
CHAP. XVII.

Of the Trypan or Trepan.

Have often before made mention of the Trepan, an Instrument by which a peece of the scull depressed, or otherwise fractured, may be turned out. There are foure things that perswade a Chirurgian to use the Trepan. The first to raise up a depressed bone, when the Piercer before spoken of will not serve the turne, and beside to take out the fragments of the broken bones, who doe presse or lye hard upon the membrane, or the substance of the braine. The second, to make way that the blood and ichorous matter, which upon the breaking of a vessell, floweth upon the meninx, may be washed, dried up, or otherwise vacuated and consumed, which would corrupt not the membrane onely, but the braine it selfe. The third, that the way may be made more open and plaine, for the application of such remedies as are fit to expedite and make the cure more facile and easie. Lastly, and especially this Trepaning supplies the defect of bands and swathes to inhibit the fluxe of blood, which cannot be used in fractures of the scull for many reasons; first, the Sphericall figure of the head will not hold a swath, unlesse it be too straight and fast: beside, the thicknes & hardnes of the scull will not suffer the vessels to be straitned with a swathe or band, so that a notable flux should be stayed or inhibited: as for the vessels of the scalpe which are without the scull, the compression of them

them with any Ligature would breed vehement paine and inflammation. For such a compression would intercept perfusion of the Arteries, and keepe in the effluxion. of the footy excrements, which usually exhale by the suture. Moreover it would constrain the blood from without inward upon the membranes, and consequently upon the braine it selfe, whence the fever, extreame paine, convulsions, apostemations of the braine, the appoplexy, and death it selfe would soone follow. These bee the causes why the Trepan is more necessary in the fractures of the Scull, than in the fractures of other bones of the body.

But before the Trepan is set on, you must set the Patient, especially his head, in a fit posture, and prop it up with swathes and pillows, that when you come to your worke, it cannot sink; as also that as little outward ayre as is possible may attaine unto the wound, of the membrane in the trepaning; for there is nothing more enemy to the braine than cold. Now we know that the warmest ayre in the hottest Summer day is far cooler than the membranes of the braine and therefore expert Chirurgians, when they goe about such worke as this, beside the muniments before spoken of which they place about the scull; they also provide Chafindishes of coales neere hand, that no cold ayre pierce at the wound or Trepaned part. Observe also that the eares of the Patient must be well stopped with Lint or bumbast, as well that no blood nor any of the medicines which are used, doe get into the eares; as also that the hole of hearing being so cloyed, he may not heare the noyse of the Trepan or other instruments which haply might affright him. Finally before the Trepan be set on, it will be fit to drill a hole in the Scull, with a three-square Wimble, in the place where the center of the Trepan must be fixed; and therefore the point of that Wimble must be no bigger than the point of the Trepan is: Such a Wimble you have hereby demonstrated.



A. Shewes the handle of the Wimble.

B. The Bit, whose head is scrued into the handle and pointed three-square.

The Trepan it selfe is a round Saw, with a center or point in the middest, which being fixed in the bone, the circumference is mooved and cutteth out a peece of the bone as bigge as the circumference is. They are made of divers magnitudes for the divers uses there may bee of them. They are framed of many peeces. A Steale or handle, much like

that of a Ioyners piercer to bee turned round. The round Saw it selfe with a hollow shanke, wherein the center or three square point is contained; a round case for the saw, which standeth a little off from it, and hath no teeth in it; for it is made to guide, limit and proportion the descent of the Saw into the scull, that it touch not the membrane, and there is also a vice set upon the shanke of the Saw, neere the head of the Handle, with a small shanke in the side of it, whereinto they put a scrue Pinne, to hold the shanke of the Case wherein the saw runnes firme and stable that it move not.

All

All these particular parts and peeces of the Trepan are severally and particularly delineated in the figure following; and beside, you have also a pourtraiture of the whole Trepan with all the parts joyned together, that in one peece you may see how to joync all into one Instrument, and how to take the parts asunder.

A, In the Figure to the left hand, sheweth the whole Trepan, with all the parts joyned together.

B, The head of the handle in which the Saw is fastened.

CCC, The shanke of the Saw.

D, The saw taken from the Case.

E, The Vice.

F, The screw which fastneth and firmeth the saw to the Handle.

G, Another screw which fastneth the Vice to the shanke of the Saw.

H, The Center or point of the Trepan.

A, In the figure to the right hand, sheweth the whole handle of the Trepan.

B, The Case of the saw.

C, The Vice.

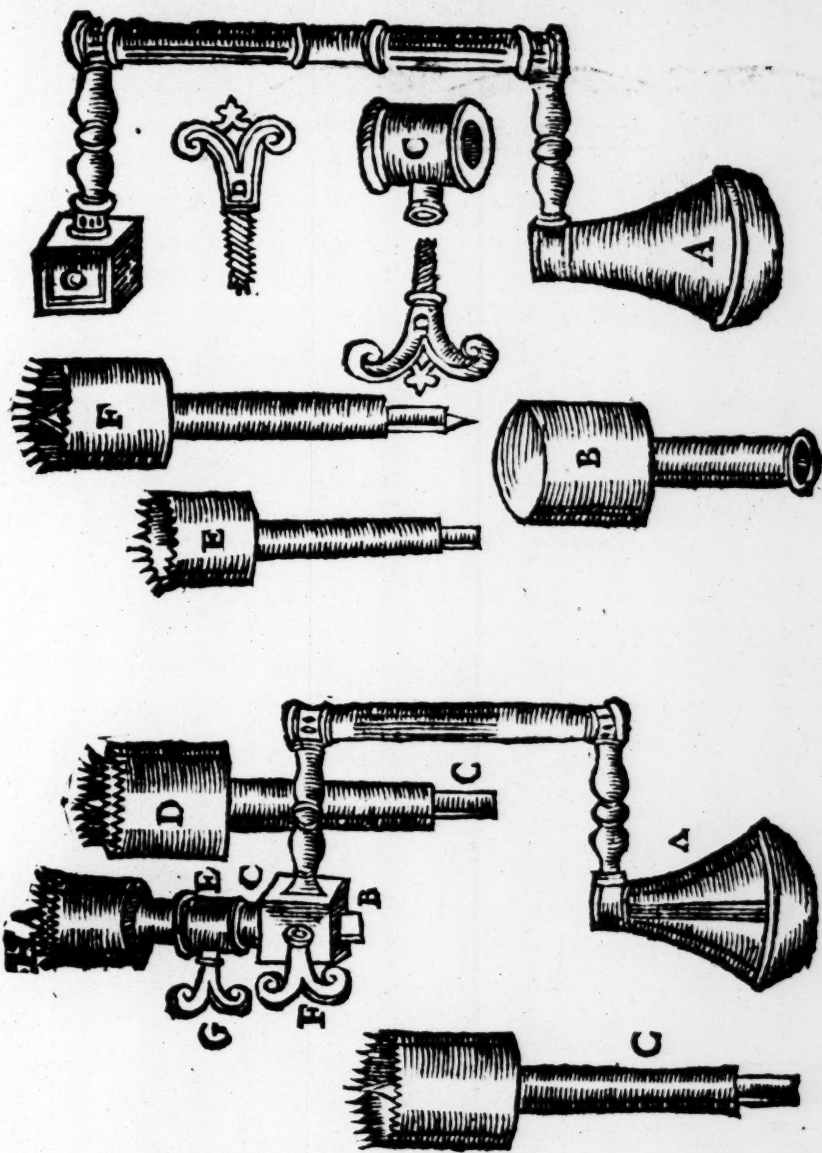
DD, The screws which firme the Vice of the saw.

E, The saw without his center or point.

F, The saw furnished with the Center or point.

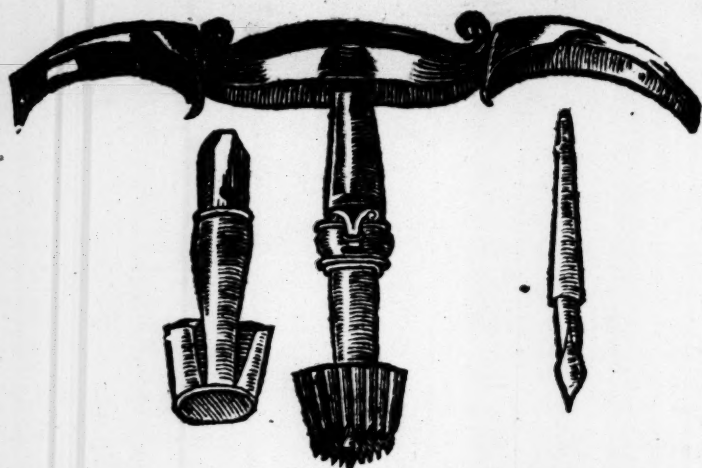
There

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& is



There is another sort of Trepan or Trefine, now generally in use amongst our *London* Chirurgians, called the hand Trepan; the head of it is made Taper fashion, smaller at the teeth, and greater upward, with cutting edges round about on the outside, to make way for it self; the shanke of the head entreth into the sockets of a straight stem & is fastned into it with a screw; the handle is made cross the top of the

the stemme, like the handle of a Gimblet (but longer)



ends
the for
Elevat
serve (the
foration
made in the
Scull) to
the de
bones. This
a semici
motion of
hand, pe
meth the op

tion with great security; for the perforation being made it cannot slip in to endanger the hurting of the *dura mater*, as the other may doe. They that will may use this head, with the handle turning round like a Piercer before described.

Now you know the forme and fashion of the Trepan, I will acquaint you also how you shall use it.

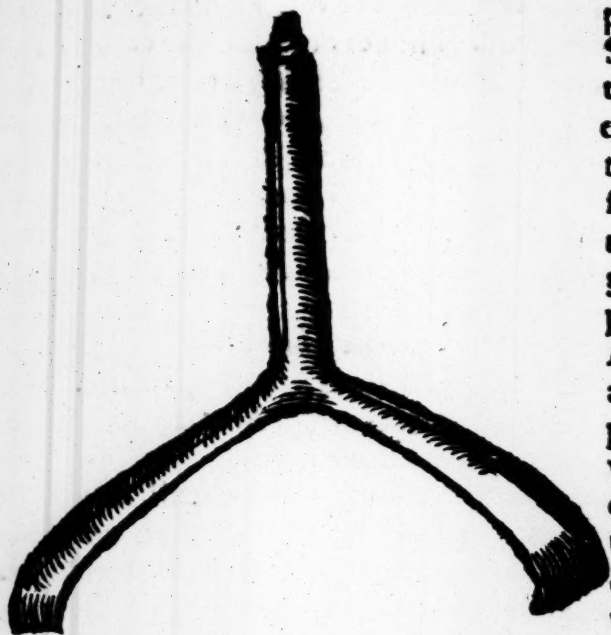
When you have bared the bone, washed the head, drilled a way for the center, fastned your Trepan therein, and screwed the Case to that depth, which you would have your Saw to cut, then with a Wimble and steady hand, winde about the handle, till you have cut away the first table of the Scull to the *Meditullium*, and entered the teeth of the Saw in the second, but entered them onely. Then take out the Center or point, and set on the Saw againe without it, for feare it should touch or perforate the meninx; for that were dangerous if not mortall. But the Center being gone, you may safely turne out the second table even to the membrane; for the Case if it be duely fastned, will keepe the saw from entrering deeper than to the membrane. You shall also annoint both the saw and the Case with Oyle, that they may runne more glib and glad, and cut more sweetely. For so you see Carpenters use to annoint their with some fresh-grease. Moreover, *Parvus* would have ye your saw and the case in cold water, whilst you are in the woterebration, because they will grow hot in the circumaction: conceive this will doe more harne by interrupting the oper

than it will doe good, unlesse the worke were to continue some long time, and the circumaction were extreame quicke, neither of which are to be feared in this businesse. The next of his observations is of more consequence, and that is about the scaling of the bone. For where either the Trepan toucheth, or the ayre taketh the bone, it will surely scale, and this scaling may be accelerated by sprinkling a like poulder of Rocket, Brionie, wilde Cucumer, and *Aristolochia*: but the Chirurgicalian must not pull off the scale, but suffer it to fall of it owne accord. When the bone is scaled, to regenerate hard and fast flesh upon it, strew on this poulder.

Recipe pul. Ireos illyrica, Aloes, manna, thuris, mirrha, Aristolochia, ana dr. 1. misce. When the flesh is growne, sprinkle on a poulder made of the pills of Pomegranates and Alume, burnt together, that will procure a Cicatrice and heale it up.

The danger of the Sawes going too deepe in the scull, makes me againe counsell you to beware that it leane not too much on either side, for the scull is not equally thicke, and beside, being round and compasse, it is harder to guide it aright than if it were plaine, where the Chirurgicalian shall be carefull to know by Anatomy, where the bone is thicker, where thinner; and beside, where there is any suspicion, he may measure the depth of the Sawes cut, with a small Probe on every side, that he offend not against the membrane on one side, before the bone be sawne through on the other; but above all let him be sure the Case of his Saw be well established by the Vice in due place.

When the Saw on every side attaines to the *Meditullium*, if hee would take out but one table, and to the membrane, if he would re-rebrate both, and yet the bone will not come out easily, you shall use this Wimble screwed in the end, and fasten it in the hole which was made by the Center of the Trepan, and so extract it with this in stead of a Levator.



He shall also make
plaine the edges of the
Scull, from whence
the peece was turned,
especially of the lower
table, lest in the disten-
sion of the braine, the
membrane should be
goaded with any as-
peritie or roughnesse.
Pareus hath framed
an Instrument for this
purpose, mee thinkes
with a little too much
circumstance, for I
thinke a paire of Pin-
cers will doe it as
well. But you shall
finde his Instrument

in the 18 chapter of his ninth booke. If the asperity bee any thing
thicke, he flies to the Chisell and Mallet, but hee would have it of
Lead. As for the small fragments and splinters of bones, if any
fall upon the membrane or sticke in it, they may be taken out with
a paire of small Pincers.

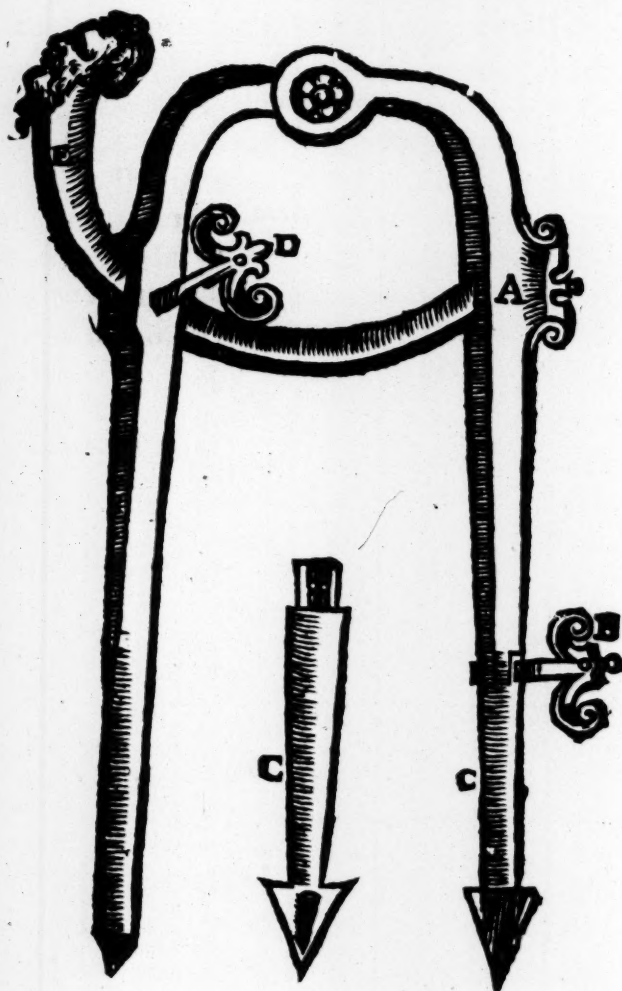
But if that part of the Scull which is fractured will not safely ad-
mit the incision of the Scalpe to make bare the bone as farre as need
doth require, as when the fracture is under or neere the temporall
muscle or upon the suture, then in steede of the large Trepan, you
may set two or three small ones, if it bee needfull, not upon the
fractured part but neere it; and so that the gutter of the second may
joyne with the gutter of the first, and the third. But if the fracture
happenupon the suture, set two Trepanes upon the sides, on each
side one; otherwise you shall teare the sinewy fibres, membranes,
veines, and arteries, by which the meninx is tyed up to the scull,
and yeeldeth his productions for the forming of the *Pericranium*.
Again, if you should think that one trepan, or on one of the sutures
would be sufficient, you should be deceived, because the *sanies* which
upon the fracture faileth on both sides of the suture upon the me-
ninx

ninx, cannot have vent; or be exhausted, because the fibers of the *dura meninx*, which rise through the future to forme the *Pericranium*, are as it were a partition wall, or hedge to stay it from issuing from that side of the future that is not trepaned, to that side which is trepaned.

To conclude, if for any reason you be willing to forbear the Trepan, you may use another Instrument, called the cutting Compasses, but the bone must be layd as bare as it should be for the Trepan. These Compasses you may separate more or lesse as you please with a screw that goes betwixt their shankes; and the point of them, which is made to cut, you may also alter at your pleasure, having diverse of them in a readinesse, which you may fasten to that shanke with a screw.

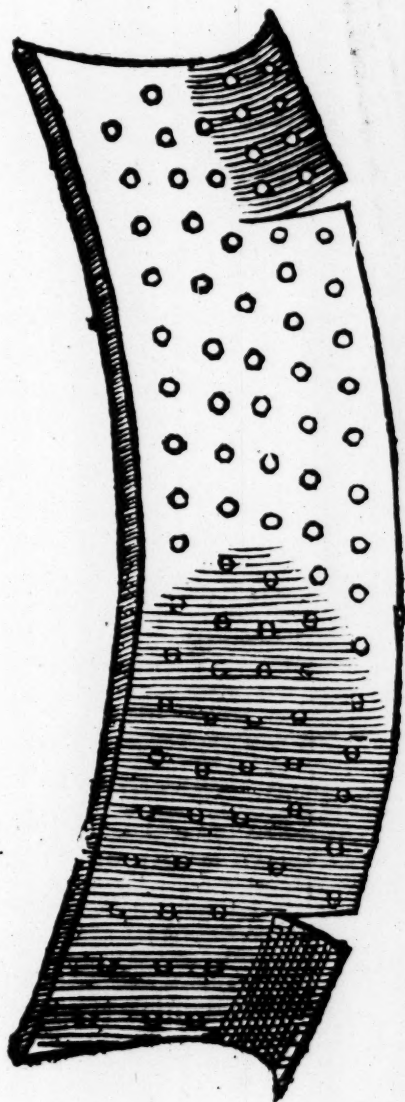
*A paire of cutting Compasses to turne a bone out
of the Skull.*

- A**, Sheweth the cutting shanke of the Compasses, which as it is wound about cutteth the Skull.
- B**, The Screw which fastneth the cutting point of the Compasses to the shanke, which you may call the knee.
- C**, Two points, either of which at the knee you may fasten to the shanke with a Screw, as they be fittest for your use.
- D**, A great screw which holds the Brace of the Compasses to the other shanke of the Compasses, which makes the Compasses the wider or narrower at your pleasure.



And because in this worke one of the shankes of the Compasse must stand firme in a certaine place whilst the other winde about to cut out the bone, it shall be fit to provide a plate of iron punched with many small holes, but not perforated, in which holes the standing shanke of the Compasses may rest without any wavering; and you must also make the plate a little curved, and hollow, that it may

may comply with the roundnesse of the Scull. The fashion of the plate is hereunder expessed.



You may also make your cutting Compasses with a head as ordinary Compasses are made, and the Screw whereby they are made wider and narrower, may be made round and long, to reach between the shankes, neere the head of the compasse. And this fashion I like better then the former, for the screw is surer, and therefore I have caused it to be hereby described.

Bb 3

CHAP.

CHAP. XVIII.

*Of the places of the Scull
which will not beare the
Trepā, of the tempo-
rall muscle, and of
fungous flesh.*



BEfore we part from the use of the Trepā, it shall not be amisse to exhibite in one chapter (though wee have toucht upon some of them before) all the places of the Scull, which will not admit of the use of the Trepā. First therefore, if the fractured bone be altogether, or for the most part, by the violence of the blow, separated from the scull; you shall not use the Trepā, either to heave it out, or to finish the separation, for feare the weight of the Instrument, or the heavinesse of his hand that guides it, should depresse it upon the membrane. Second-

ly, you shall not set the trepan upon a suture fractured for the causes mentioned in the former chapter. Thirdly, you shall not set the Trepā upon the forehead bone above, betweene the eyebrows and neere about them. For first, the flesh will not regenerate

rate in that place, because under that part of the upper Table there is a cavity, full of a white and slimie humor, and ayre, which reacheth on either side to the five bone of the Nose: Or say that the bone is there so thicke, fast, and solid, that no nourishing Iuyce can sweate through it to engender flesh. Adde hereto, that if the bone be there trepaned, there will flow unto the place a confluence of those excrements which are usually evacuated by the eyes and the nostrils, and those excrements will hinder the drying, and consequently the healing of the Ulcer. And that the passage out of the nose & the brain, is very open to that part of the forehead, *Parvus* confirms this by an experiment of his own, in a Patient whom he trepaned in that very part; for saith he, when he shut his mouth and his nostrils, and yet did strongly expire, the ayre that issued at the trepaned place, would blow out a good great Candle. And in this place the bone in some bodyes is much depressed naturally, in all bodyes somewhat; so that the Chirurgicalian may mistake it for a depression upon a fracture, if that part happen to be wounded, or sore brused, unlesse he have this observation in his minde.

Fourthly, you shall not set the Trepan neere the lowest edges of the skull, least if there be a way open, the soft substance of the braine, pressed with his owne waight, should sinke downe into the orifice.

Fifthly, you must not set a Trepan upon the bones of the *sinciput* in a childe, for those bones of the skull continue longest soft, and will not beare the impression.

Lastly, not upon the Temple-bones, because of the temporall muscle, whose section or incision, saith *Hippocrates*, breeds a convulsion in the opposite temple; for being cut overthwart it quite looses his proper action (to wit) of mooving the lower jaw to the upper. And this smal muscle is sometimes so tendonous and strong that I have knowne a man who could share in sunder a sixepenny naile. Now the opposite temporall muscle being sound, and using his strength, when the wounded muscle which is his Antagonist, cannot move against it; it must needs come to passe, that the jaw on the wounded side, should follow the traction of the sound muscle, and so all the parts of the face must be writhen, tortured, and convellled toward the sound side, the wounded muscle being resolved. For it is *Hippocrates* his rule, that when there are muscles (as hee

calletk

calleth them) *Conganeres*, in opposite parts, which are of equall number, magnitude, and strength, the resolution of one part brings the convulsion of the other.

Neither doth this mischiefe onely follow the wounding of the temporall muscle, but moreover, because it is in continuall motion in our speaking and chewing, being divided it cannot reunite. Adde hereto that the seate of this muscle is just under the commissure of the stony bones; now upon a commissure or future you have beene already taught you must not set a Trepan. Finally, through the body of this muscle, many veines, arteries, and more sinewes are sprinkled, which if they be cut, many drie symptomes must needs follow, a feaver, inflammations, unsufferable paines, convulsions, not onely of the temple, but of the whole body, and in the end death it selfe.

Let no Chirurgian therefore be so rough as to attempt the section of this muscle, the pricking or brusing whereof with the corner of a thin trencher, I have knowne bring death in lesse than foure and twenty houres. But if there be neede of trepaning, let him set it above it, or at the side of it, as neere the affected place as he safely may, not touching the muscle it selfe. *PARCENS* in such a case, made his incision three cornered a little above the fracture, and the next day, which was the third after the wound received, hee set on his Trepan; within a few dayes after he tooke out foure shivers of bones, and put into the wound a smooth pipe of Lead; with two holes in the end; every dressing commanding the Patient to stop his mouth, and his nostrils, and to expire with all his strength, holding his head downeward; so by that pipe much matter came away, which was collected betwixt the Scull and the meninx. The other superfluities he washed away with a sponge filled with a detergent decoction, and at length cured the Patient through Gods assistance. The figures of these two Instruments are in the next page deciphered.

The pipe of Lead smooth and broad in the end, by which the Sanies was gotten out.

The syring wherewith the wound was washed.



Another story he tells, which I will insert, because of the cure of proude and fungous flesh. A mans Temple-bone was fractured with the sliuer of a stone; he fell upon the ground, and blood issued out of his mouth, nose, and eares: he vomited exceedingly, and lay mute and astonished foureteen daies; he was full also of convulsions, and his face was puffed up. He was trepaned in the fore-head-bone, at the side of the temporall muscle, The five and twentieth day, a soft spungy flesh, of exquisite sense grew out of the hole made by the Trepan, whose growth no Cathetericall poulders could prohibit, yet at length he recovered. We call this fungous flesh, because it is soft and like a Mushrome, is narrow at the root, and growes broad at the top, and doth increase or diminish according to the affluence of the matter, or the industry of the Chirurgicalian, in intercepting it; it smells abominably, they call it in *France* *Saint Fiacers* figge. As in the barke of a tree, from the excrement of the aliment, a humour halfe rotten, thicke and glutinous, sweats through, and gathering together by degrees, is heaped up into a Mushrome, so out of the broken vessels of the *dura mater*, and the scalpe issues blood of a melancholly temper and consistence, and is increased by that which Nature sendeth to repaire the flesh where it is decayed, and so it growes into a spungy protuberation, which therefore *Galen* saith, carries the condition of the place to which it growes: This spungy flesh is eaten away by medicines, which have a specificall quality to consume such superfluous flesh, such as are those which doe dry exceedingly, but weare and cate away more moderately, such as that is which followes.

Recipe

Recipe sabina drams 2. cera dram 1. pulverizentur simul, aspergatur caro excreſcens: or Recipe Hermodactylorum combuſtorum, uncia dimidium, fat pulvis in eundem uſum. But if that ſpongy fleſh (as often it happens) grow to be as bigge as an egge, thou eye it as neere the roote as you can with a thred of ſilke, and twitch the knot till it fall off, and upon the root ſtrew the poulders before named, for ſo it will ſooner die than by ſharper Cathereticall medicines.

CHAP. XIX.

Of the Corruption and rottenneſſe of the bones of the Scull.



Sometimes corruption overtakes the wounds of the head, and a *Sphacelus* the bones of the Scull fractured, which hapneth, becauſe they are touched with the outward ayre, which they never before felt; or becauſe the *Sanies* being concluded under them, putrifies it ſelfe, and rottes them: or becauſe the Chirurgian for want of ſkill, applies ſuppurating & oily medicines unſeaſonably, whereby the bones loſe their natural temper, and become over-moyſt, contrary to their nature, and the neighbouring fleſh is overheated and turned into quitture, which falling downe to the bone where it findeth ſtay, makes the Ulcer ſoule and ſordid, and by degrees faſtens upon the bone, a malignity whereby it ſuffers inflammation; yea, *Galen* hath it, that the beginnings of inflammation in the Scull proceed from the bone oftentimes. This mutation to a ſtate againſt nature and corruption, which we call *Caries*, may be diſcerned by the eye, (to wit) when the bone turns from white to be yellowiſh, or begins to grow blacke: partly alſo by the probe which findes it rough, unequall, not ſmooth as it was wont to be and beſide, when the rottenneſſe hath prevailed, the probe will finde it fungous and ſpongie, and ſinke ſomewhat into it, or at leaſt beare it before it, if it be a little preſſed. Yet this laſt ſigne is not perpetuall, eſpecially after a while; for the rotten humidity in time will be driered up, and then the bone will grow ſo dry, that a Trepan will hardly pierce it, and yet be carious too: but the great

the argument of a carious bone is when the flesh above it is too soft, and washy, and almost without sense: This Caries or rottenness of the bone must be cured with Cauteries, either actually or potentially. Such a poulder sprinkled upon the bone is awaylead.

Recipe Ireos, Flor. Aristol. an. dra. 1. Centaurij drās 2. Corticis pini
alfe an ounce fiat pulvis subtilissimus. But if the caries be much, you shall use the scraping instruments before described in the 11. c. and if it goe through the whole bone, you shall not divide the corrupted part from the sound, but suffer it to fall away of it self, yet may you be now and then moving it with your probe, for so Nature will sooner shoot it off, but I can limit you no time. As for the place of the Scull where the Trepan ranne, the bone that hath taken the ayre, that which was Cauterized, or whereon the Cephalical poulders have beene shed, they all commonly scale within four or fifty dayes more or lesse, according to the difference of the age, temperament and habit of the Patient: and in the like processe of time a broken bone will unite by a Callus, which (as I sayd) is as to a bone, as a scarre or a Cicatrice is to the skinne.

Sometimes it happeneth that a part of thy bone is tainted with Caries or rottenness, but the whole bone with a *sphacelus*, and is away. And in such a case a Periwig may be artificially made to defend the head from outward injuries, for the bone cannot be restored, neither can any plate of gold be so couched that the scalpe should grow over it; and he that tells not his Patient so, is an impostor, and will convey the gold into his owne pocket.

CHAP. XX.

*Of the mischiefs which happen to the dura meninx
in the Fractures of the Scall.*

IN the fracture of the Scull, most-what the fault of the Chirurgian in using the Trepan, and other Instruments, sometimes is the cause that the *dura mater*, or *meninx*, i. the membrane next under the scull is violated by being cut or torne. The medicines to cure this fault are called *agglutinantia*, as if we should say, gluing, or sawderring medicines. *Pareus* hath a good one which is this *Recipe Coloph. drams 3. myrrha, aloes, masti. dis. sanguinis draconis ana dram. 1. croci scrup. semis. sarcocolla dram semis: misceantur & fiat pulvis subtilis.* The other part of the cure which is to cleanse the wound from *Sanies* or any other rotten matter, gotten betwixt the Scull and the *meninx*, may be performed by a probe with linc or rather a ragge rowled many folds about it, and wet with Syrrup of Roses or wormewood, and a little *Aqua vita*; and this the Chirurgian shall doe every dressing, commanding his Patient to stop his nose and mouth, and then expire as fast as you can, that so the matter to be evacuated may rise, and the probe to meete with it.

Moreover because the *meninx*, if it be tumified upon incision or laceration, will rise and haply be offended against the rough edges of the Scull which was cut with the Trepan or otherwise unequally fractured, therefore you shall provide for your probe a round and smooth and broad head, wherewith you may gently depresse the membrane, that so the *Sanies* may have free vent: and this you shall also do every dressing, and then sprinkle on your sawderring powder, & after lay a spung upon it, moistned with a drying and corroborating decoction, and after well wrung. The decoction may be such as followeth out of *Pareus*. *Recipe fol. salvia, majorana, betonica, rosarum rubr: absynthii, myrtillorum, florum chamomeli.*

*ali, meliloti, stachados utriusque, ana m. 3. semis, radicum Cypri-
 calami aromatici, ireos, Caryophyllata, angelica, ana balse an
 ounce: bulliant omnia secundum artem cum aqua fabrorum, & vino
 ubi fiat decoctio; Or instead of this decoction you may moisten
 the sponge with Malmesey and a little *Aqua vite*. Above all put a
 Maister of *Diacalcesteos*, but made liquid with vineger or Wine,
 wherein Roses have beene steeped. Remember alwayes that you
 make no straight Ligature upon the Scull, nor any thing which is
 cavie, or hard, for those things will breed paine and inflamma-
 tion: and let the Patient, if he can, lye upon the wounded side, and
 now and then hold his nose and his mouth close, and expire or
 breathe out as strongly as he can, (as I have before sayd) for so the
 venies will better issue. Notwithstanding, let the Patient in the
 position of his head, finde his owne ease most what, for Nature it
 is who must perfect the Cure, and therefore molest her not too
 much.*

Sometime upon the use of the Trepan, or otherwise the me-
 ninx may be inflamed and swell with a phlegmone out at the fra-
 ture above the edges of the Scull, upon which inflammation ma-
 ny grievous symptoms must needs ensue: Heere I would not
 have a Chirurgicalian, though expert, goe alone, but call for the ayde
 of a Physitian: but the worke of the Chirurgicalian shall be to en-
 large the orifice with his cutting Pincers, described in the four-
 tenth chapter; the Physitian may consult about bleeding, purging,
 yet and the rest. In the meane time the inflammation may be mi-
 gated with such a fomentation. *Recipe sem. Lini, Althe, fanicu-
 l, psil. ros. rubr. ana ounce 1. solani, plantaginis ana M. 1. bulli-
 nt in aqua Communi & fiat fons.* You shall also instill into
 the eares *Anodyne* and repellent medicines, or what else the lear-
 ned Physitian shall prescribe. But if all this proceffe will not
 serve the turne, but that there remaine a suspicion that there is
 some purulent matter concluded under the membrane, the Chi-
 rurgicalian with his Lancet shall divide it, carrying the point there-
 upward and outward, least he touch the *Pia mater*, or the
 braine it selfe. For though this bee a dangerous operation,
 yet many have beene knowne to recover with it, and in
 extreame dangers, extreame meanes are to bee adventured
 upon

upon, because without that helpe, death must of necessity follow.

Another accident may also happen, no lesse fearefull than the former, upon a fracture. When either through the vehemency of the blow, or the coagulation of blood upon the membrane, or because it hath taken the cold ayre too much, or through default of the Chirurgicalians medicines, not proper for the part, or finally because the proper substance of the membrane conceives putrefaction it may happen, I say, that the very meninx will become blacke. Heere the Chirurgicalian had needs have his wits about him. Therefore the blacknesse proceed from the vehemency of the contusion, he shall powre upon it a little oyle of the yolkes of egges with a morient of *Aqua vita*, a chieve or two of Saffron, and small quantity of the poulder of *Iris*, mingled with them. And then foment it with a fomentation made of discutient and aromaticke simples, boyled in water and wine, and above that *Vigoes Cera*. But if the blackenesse proceede from the congealed blood, bathe with the following decoction, till the blacknesse vanish. Recipe *Aqua vite ounces 2. granorum tinctorum in tenuem pulverem tritorum dram. 2. semis. croci scrup. 1. mellis rosati unc. 1. semis. sarcocolla dram. 3. leviter & simul bulliant omnia*. If it come from the coldnesse of the ayre that hath taken it, use the medicine following till the membrane recover his colour. Recipe *terebinth. Ven. ounce 3. mellis rosati ounces 2. vitellum ovium, farina hordei dram. Croci scrup. 1. sarcocolla dram. 2. Aqua vita dram. 3. incorporenta simul & bulliant paululum*. If it proceed from the inordinate use of moist & oylie medicines cleanse it away with dryers. If from the use of biting and hot medicines, temper it with such as are more gentle and coole. Finally, if it proceede from the putrefaction of the proper substance, *Vigo* useth this medicine following. Recipe *Aqua vite ounces 2. mellis rosati ounce semis. misce*. And if that be too gentle, *Parvus* useth the following decoction. Recipe *Aqua vite ounces 2. mellis rosati ounces 2. pulveris mercurialis dram. unica bullitione bulliant*. Or this, Recipe *Aqua vita ounce 1. semis. syr. absinthii & mellis rosati ana drams 2. unguenti Egyptiaci dram. 2. semis. sarcocolla, myrrha, aloes ana dra. 1. vini albi odoris ounce 1. bulliant leviter omnia simul, colentur ad usum distillat*. But if the putrefaction be so stubborne and refractary, that it will

not yeeld to these remedies, then use *Aegyptiacum* alone, but made with Plantane water in steed of vineger, or you may use the poulder of Mercury alone, or mingled with the poulder of Allume. For such medicines must not be balked in such a disease. And *Galen* saith, that if there be no phlegmone, the *dura meninx* will well endure them. And two reasons may be rendred for it. First, because hard and dry bodies, such as are membranes, are not easily affected, but by those things that have a vehement operation; secondly, because it must be the Physitians chiefe care to conserve and restore the native temper of every part, with such medicines as are of temper alike unto it. But if these medicines will not prevaile, but that the membrane swell about the scull, and remaine blacke and dry, and the Patients eyes become flaming, prominent and wandering with jactations and a phrenzie, and that these mischiefes are not momentany, but stable and permanent, then hold thy hand, and say death is at the doore.

Thus have I run through the diversities of Fractures of the Scull; the Instruments the Chirurgicalian shall use in them, and many of the symptomes which accompany them; wherein I have beene more prolix, because it is a noble place and of great and frequent use; yet I have passed by many particulars, which out of expert Chirurgicalians and Physitians might have beene added to excellent purpose. But you must remember that considering my first intention, this that hath beene sayd is a worke of supererogation.

CHAP. XXI.

Of wounds of the necke and throat, and of stanching of blood.

IN the wounds of the necke and throate, I will be but brieft; those of the necke, if they be but shallow, are easily cured, if they be somewhat deeper, they are more dangerous, because there are the tendons of many small muscles: but if they pierce the rackebones, and divide the marrow of the backe, then all the parts under the wound will be paralyticall. If the wound be in the throate, it is

a venture but the jugular veines, or the sleepey arteries, or both may be divided, and then the fluxe of blood must be carefully stayed, for blood is the treasure of Nature. If the artery be wounded, the blood is thinner, and comes away leaping with a kinde of subfultation. If the veine, it is thicker and blacker, and comes away more slowly. If the wound be not deepe, nor any notable vessell divided, you may clap on a pledget with such a medicine. *Recipe Terra sigillat: boli armeni, ana drams 2. thuris, mastiches, myrrha, aloes, ana dram 1. farine volatilis molend. halfe an ounce: fiat pulvis qui albumine ovi excipiatur.* And then binde it up. *Blondus* commends this wherewith he saith, he hath stayed the blood of veines and arteries. *Recipe vitrioli Rom. sanguinis draconis, boli armeni, pilorum leporis, arguginis lebetis, aloes, thuris, tela Arachnes, & omnia commisce cum albugine ovi.* If that will not doe the feat, take away all that covers from off the wound, and with your thumbe presse the wound and orifice of the vessell which is decayed, till the bood be clodded, and so much dryed about it, that it will close up the vent. If that will not serve, you must finde out that orifice of the vessell which is next his originall, and with some part of the flesh, stitch it up, and this way also will serve the turne when the joynt is dismembred. But because when such a notable veine or artery is divided, the orifices will be retracted, and shrinke upward and downeward, the Chirurgian in that case shall divide the skinne till he finde the orifice, and then stitch it up, and afterward binde it safe, and not remooove his Ligature till the flesh bee growne to cover the orifice. If the condition and nature of the part will not admit of this operation, then he shall clap on a Caute-ry, sometime actuall when the part will beare it, sometimes potenti-
 ally, as the poulder of *Vitrioll* burnt, or a little quantity of Mercury, and burnt Alume in poulder, and the *Eschar* he shall not hasten away, but suffer Nature to shed it, and so there will be no danger. It may also happen, that if the vessell be not quite divided by the wound, the Chirurgian shall be constrained to divide it, that the ends thereof parting asunder, the flesh of the neighbour parts may stop the fluxe, being assisted by such helpes as are before spoken of. But this is the last refuge, and the Chirurgian shall not ascend unto it, if he can otherwise chuse.

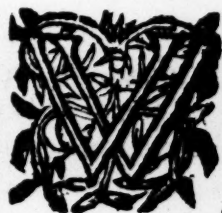
If the rough artery or the gullet be divided, the Chirurgian shall artificially

artificially stich up the wound, and in the meane time nourish his Patient with brothes or gellies, but not suffer him to eat any thing which may extend the part in the swallowing : He shall also cause his Patient to use such a gargle warme, which will supple the part, ease paine, give him liberty of breathing, and beside, serveth to deterge, and agglutinate, or sawder the wound. *Recipe Hordei, m. 1. florum rosarum pug. 1. passul. mandat. iuinbar. an. halfe an ounce, glycyrr. ounce 1. bulliant omnia simul, addendo mellis rosat. & Iulip. rosat. ana ounce 2. fiat Gargarisma.* One instance in *Pareus*, I will add, because it happened to our owne Countreyman.

Two *Englishmen*, for their pleasure walked to a wood, one of them was full of money, and beside had about him a gold chaine of good waight ; his Companion suddenly set upon him, stabbed him through the weazon and the gullet, and cast him aside among certaine Vines, rifled him and leaving him for dead, got into the City. The wounded man with much adoe, got into a Cottage neere hand, where having some small helpe to relieve his wounds, he was brought into the City, and committed to *Pareus* his care. He found the weazon quite cut asunder, which he presently sewed; the gullet which was also divided, he could not come to stich, for it was fallen downe upon the stomacke : that was his death, yet he lived to bewray the murderer, who also had his deserved punishment, being broken upon the Wheele.

CHAP. XXII.

Of the wounds of the Chest.

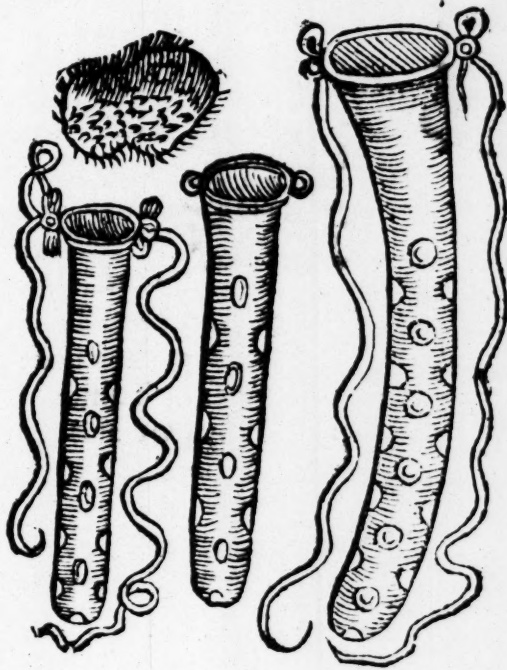


Wounds of the Chest which are penetrant (for of those onely I will speake) are distinguished by this, because if the Patient stop his nose and his mouth; wind will breake forth at the wound, so as it will blow out a Candle set neere it. In this case it is controverted whether the wound should be as suddenly healed up, as may be, or whether it should be kept open. If it be kept open, the danger is, that the cold ayre will enter and overcoole the heart, and beside that the vital spirits will find way by the

72
the wound, and be expended, On the contrary, if the wound be closed, the blood which falleth upon the wound into the capacity of the Chest cannot get out, but there will putrifie, whence will proceed Fevers, the Fistula, and such like accidents, so as sometimes the Chirurgian is constrained to enlarge the orifice of the wound for the better avoyding thereof. This question is easily asswoyed. For if there be no blood, or very little shed into that capacity, it is best to heale it up as soone as you can, But if there be much, you must keep it open till it be gotten out. But how shall that be done? You must place your Patient upon a bed, with his head and brest hanging over the side, with a footstool to leane his Elbow on, to stay his body with; and then let him stop his Nose and his Mouth that his Longues may swell, and therewith the midriffe will rise, and so the blood will issue at the wound, especially if you cleare the orifice from clodded blood with your finger, or some fit Instrument. After some part is come away, lay him at ease upon his bed, and deliver at the wound with a large syring an injection, made of a decoction of Barley, *Mel Rosarum*, and browne Sugar; and having that in his body, let him wallow on both sides, as it were, to rinse his chest, and then lay him over his bed side, as before to avoyd that which was cast in, with which the remainder of the blood will also issue. The next day iterate the injection, but make it more detergent, yet put in no very bitter things, for the bitterness will easily passe through the Longues into the mouth, and breed an intolerable distaste. Hasten your cleansing of the Chest as much as you can, that you may leave Tenting of the wound, for it will soone grow Fistulous. And when in the beginning, you are constrained to tent it, take heed you make not your tents of Lint, least it be drawne by the brest into the Chest, but make it of fine old Cloath, and let a good part of it hang by, or be fastned to the boulster, that you may retract it at your pleasure; for if it fall in, it is certaine death yet I know *Fabritius* in his Century, makes mention of one who cast up two Tents which got into the capacity of the Chest, about three monethes after they fell in, Now if the wound doe degenerate into a Fistula, which it will sometimes, do the Chirurgian what he can, then is the mischiefe doubled, for Fistulaes of the Chest are scarce ever cured, and that for many reasons. First, because the muscles of the Chest are in continuall motion; secondly, because

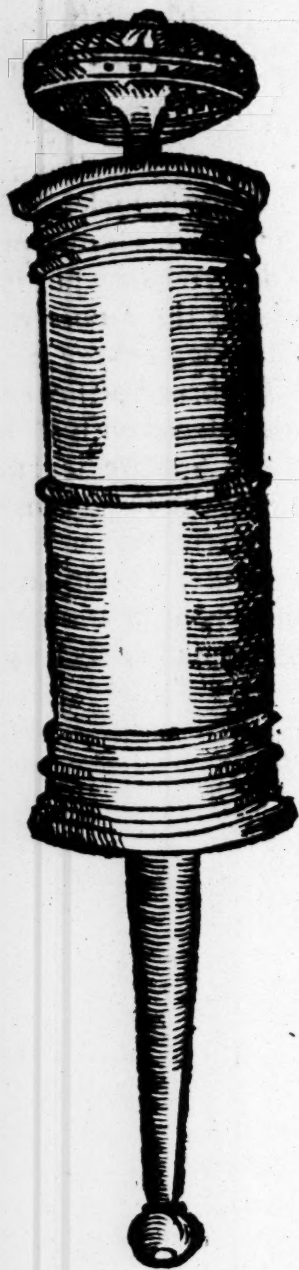
the ribs hath no other inward covering but the *pleura*, which hath little blood in it. Thirdly, because the wound hath no flesh to rest against, so that the lips of it cannot be stitched or drawne together by a Ligature, that so it might heale.

But to returne to the Syring: You must carefully observe how much of the injection you cast in, and looke you have it all againe returned, for if any of it stay behinde, it will doe mischief. After the injection is returned, you must provide a silver or a leaden pipe with two or three holes in the end of it, which you may put into the wound, if it be fistulous, that by those holes the *Sanies* may issue; you shall make the outward end of it broade, and tye it fast with strings that it get not into the capacity. The broad orifice of it you shall close with a soft Sponge and large, moystened with Wine and *Aqua vite*, and that warmed together: this Sponge will not only keepe out the cold ayre, but will also receive the sanious matter which issueth from the wound, and so much the rather if the Patient stay his breath often, as we have before saide, and tumble on each side, especially on that which is wounded. Neither must you forbear the use of this pipe till the Fistula become dry, then may



you safely indeavour the Cicatrice, not before. The figures of such a Syring, with such pipes and Spunge as I before spake of, are here represented, saving that the Cutter hath made too many holes in them.

Vpon the wounds of other particular parts I will not insist, because I intend not any generall Treatise of Chirurgerie, but only of the use of some of the Instruments, and therefore I will now proceed to those wounds which come of Gunshot, about which many Instruments are of necessary use.



CHAP. XXIII.

The division and signes of Gunshot wounds.



HE wounds made with Gunshot are either more simple or more compound.

We call those more simple which have fewest symptoms,

those more compound, where in there is greater contusion, laceration, distemper or Tumor. If the Bullet light in a fleshy part and therein determine, and no notable vessell be broken, the wound is more simple and wil be cured well nigh as easily as a wound made with any other weapon that wounds with

contusion; for contusion lesse or more is common to all wounds of Gunshot. But if the contusion be notable, the laceration great, if any bone be broken, if any notable vessell be violated; finally, if there

there be any great distemper or tumour succeeding the wound, then is the wound more compound, and the cure of such symptomes doth many times divert the Chirurgian from his course of suppuration, till he have provided for that which urges him more. Again, sometimes the wound is but superficialy or descends not deepe, sometimes it penetrates farre, sometimes it goes through and through the body, and according to those varieties the cure is more easie or difficult. Moreover, there is great difference in Bullets, some are great, some little, some betwene both: some are, as we call them, but Haile shot; all of them round. According to these differences the Chirurgian must fashion himselfe and vary his medicaments. Alwayes remembring that which I have saide before, that he impute not the many symptomes which follow this kind of wound to any poyson, or combustion, but to the vehemence of the contusion, laceration, or fracture made by the impetuous force of the Bullet.

For the signes, there is one generall that the wound is orbicular or round: the Colour of the part is also altered and becomes livid, blewish, greenish, or betwixt both. Adde hereto that the sense of the blow is gravative, as if some huge weight had fallen upon the part, neither doth the blood issue proportionably to the wound, for the parts being sore brused, doe presently swell: in so much that you can hardly insinuate a pledget into it; for the lips of the wound being tumified, hinder the issue of the blood. There is also in this kind of wound, a very great heate, caused either by the swiftnesse of the motion, or by the vehement impulsion of the ayre, or else because the contused parts being driven one against another, raise heate by attrition. The reason why a Bullet makes so great a contusion, is because it hath no corners to cut his entrance, but is round, and therefore cannot enter without extreame force, and thence it is that not the wound onely is blackish, but the neighbour parts also are livid. Hence also proceed those many ill symptomes of paine, fluxion of humours, inflammation, apostemation, convulsion, phrensie, palse, Gangrene, mortification, and at length death it selfe. The contusion also and the rending attrition and tearing of the adjacent parts, make the sanies or matter of the wound which it belches out, to be of a noysome and odious savour, and so much more plentifull because to a part so notably offended many humours will flow out

of the whole body, which at the part affected cannot be governed by the weakned naturall heate thereof, and therefore rot into corruption. But if you adde to this confluence of humours, whereby naturall heate is suffocated, those other universall or particular causes of putrifaction in the ayre, and in diseased bodyes, then will the matter or *sanies* be as neere a poyson as putrifaction can attaine being exalted, and consequently the stench and other symptoms more dangerous and mortall. Now I proceed to the Cure.

CHAP. XXIII.

*What must first be done in the cure of wounds
by Gunshot.*



AS soone as a Chirurgian is called, he must first of all enlarge the wound (if the condition of the part wil suffer him) as well that the *sanies* or matter may more freely issue, as also that he may more easily get out any thing which was thrust in with the Bullet (as ragges, tow, Paper, peeces of Harnesse, and the like) or the Bullet it selfe, broken splinters of bones, or brused flesh, all which with as much expedition as may be, must be drawne away, for in the beginning the paine and inflammation is not so great as it will be afterwards. For the better performance hereof, the patient must be put into the same posture wherein he was when hee received the wound, otherwise the conversion of the muscles will either wholly interclude and shut up the passage by which the Bullet entered, or at least make it much narrower.

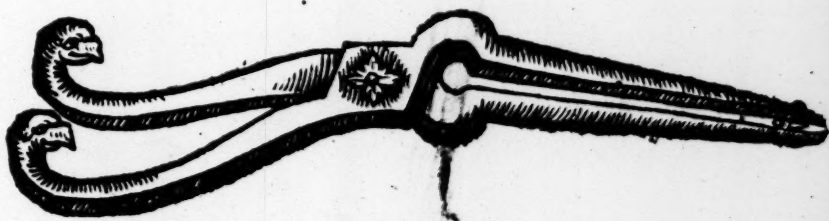
Now those strange substances of what kinde soever they bee, which are contained in the wound, must be sought for, if it may be with the finger, for that is a more certaine search than with the Instrument: yet if the Bullet goe deepe, the Instrument must bee used, to wit, a probe round, and obtuse, yea, a little burned at the end, that it may enter without paine; with such an one the Chirurgian shall try if he can finde the place where the Bullet is couched: yet hath it beene often seene, that what the Instrument could not finde,

finde, the finger hath discovered, observation being therewithall made, where the paine, where the hardnesse, where the Tumor, and finally where the flesh was livid and discoloured.

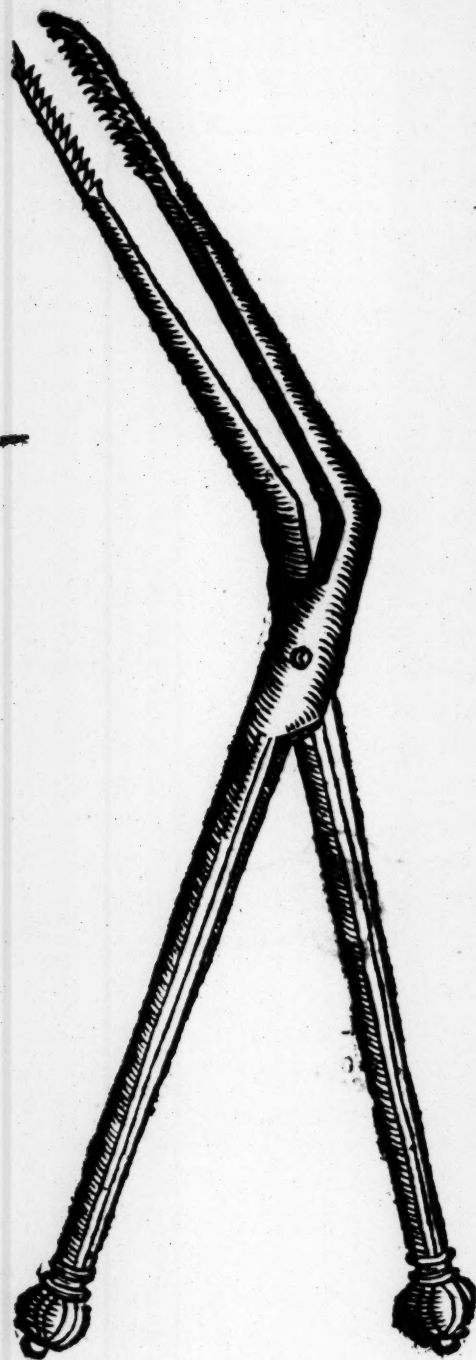
The den of the Bullet being found, the next care is how to get it out: That must be done by an Instrument made for the purpose. Of these instruments there are divers formes in use amongst Chirurgians, all which must be at hand to answer the variety of the Bullet, or the part wherein it is lodged. For a Chirurgicalian must fit his Instruments to the part, and to the wound; he must not fit the wound to his Instruments.

These Instruments framed to draw out bullets or other strange substances out of wounds made by Gunshot, are almost all called by one generall name, *Bills* or *Beakes*, as the Crowes Bill, the Cranes Bill, the Drakes Bill, the Parrots Bill, and the Swans Bill. One other there is made like the head of a Snake, and another headed like a paire of Moulds, wherein Pistoll Bullets are cast. The descriptions of them all you have hereafter expressed with their particular names, that the Chirurgicalian may make his choyce according as the present occasion shall admonish him.

The toothed Crowes Bill.



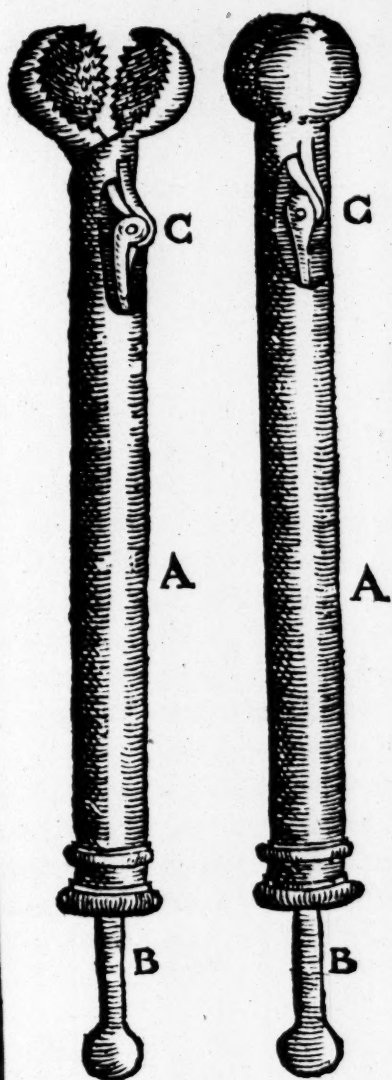
The crooked Cranes Bill with the teeth like a Saw, you shall finde described in the next Page following.



There is also a Cranes Bill which is straight, whose inside is rather rough and unequall like a Smithes File, than toothed or indented like a Saw, and that is fittest to draw out Haile-shot, small Plates, sharpe splinters of bones and such like, which are deepe in the flesh. And if these things require an Instrument which will hold somewhat faster, then the Chirurgians may use one somewhat broader and more unequall in the insides, and a little hollowed which is very properly called the Drakes Bill, to which it is very like. These two Instruments need not be disciphered, for any man may easily imagine how they should be made.

If the bullet be rounder and larger, then the Moulds are to be used, made after this manner following.

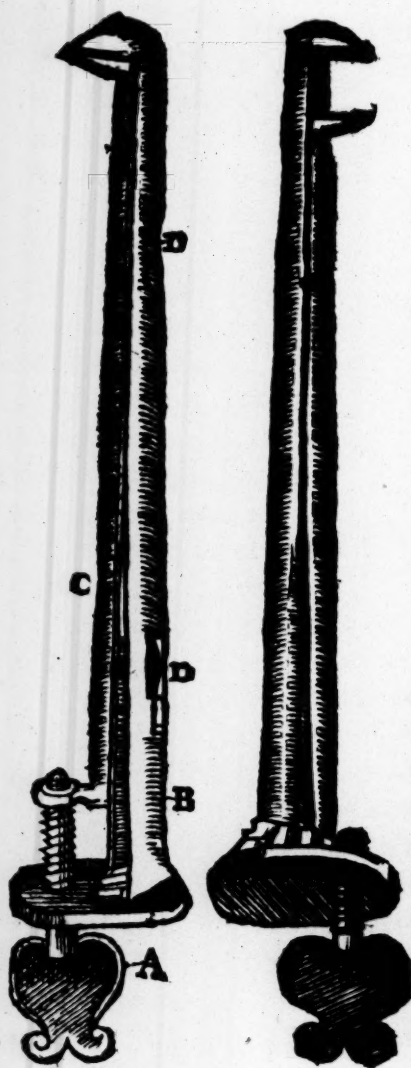
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The head must be like the head of a paire of moulds, the body must be round and hollow, and is in the figure marked with *A*. Through that hollow body runs a probe of iron marked with *E*, with a vice at the top like the vice of a pumpe marked with *C*, thereto with a pinne is fastned one side of the mould head which is moveable, so that when the probe is thrust upward, the head of the mould opens; when it is drawne downe, the mould closes and holds fast the bullet till all be drawne out of the wound together. The Instrument called the snakes head is made after the same manner, saving that the head of the Mould is round, and the snakes head is flat and depressed, and therefore it need not here bee delineated: the use of it is when the bullet is flatted a little and hath lost his compasse. Somewhat different is the Instrument called the Parrots Bill, and serves best to draw

out any small peeces of Armour, Mayle, or whatsoever else the violence of the shot shall breake off and carry before it into the flesh or the bones: and therefore you have the figure of it here exhibited.

A



A, Sheweth the handle of the utter screw.

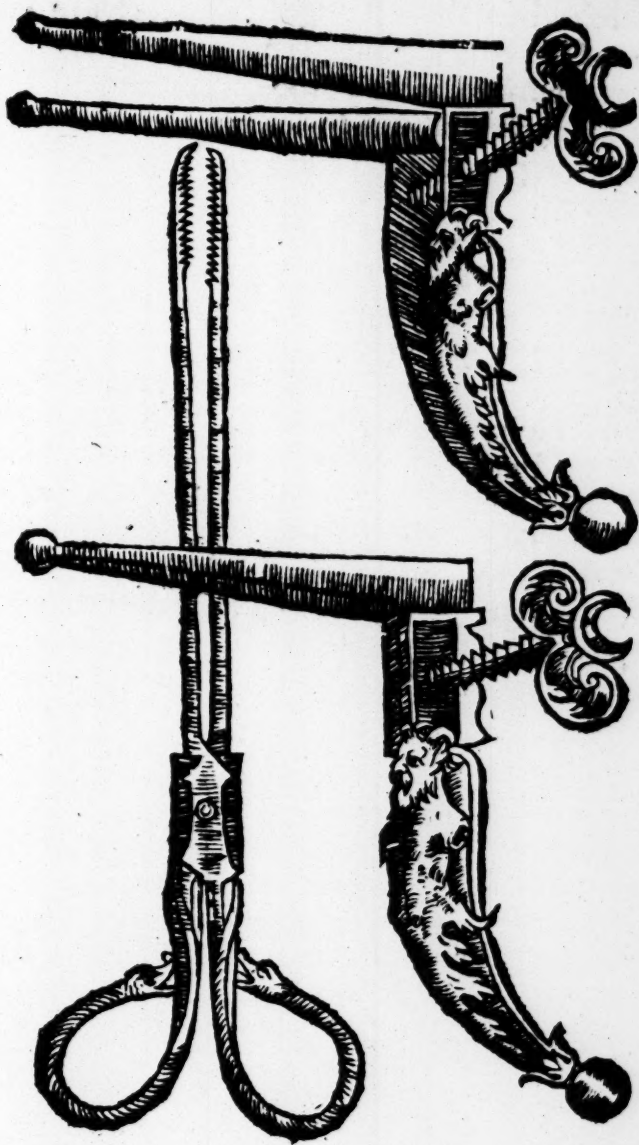
B, The trench or hollow screw in which the utter screw is inserted, to which it is fitted, and wherein it is turned.

C, The moveable shaft or spindle which the utter screw elevateth and sinketh.

D, A double port in the immoveable hollow trunk, which with a Beake like a Parrot at the end, whence the Instrument hath his name; and this hollow trunk and the ports therein, doe governe the motion of the shaft or the spindle.

There is also another Instrument called the Swans beake, the sides whereof are opened by a screw when it is insinuated into the wound, and so the wound is dilated; then they have another slender Instrument called the Cranes beake mentioned even now, with which as with a payre of pincers, they take any thing out of the wound so dilated: the figures of both are in the next page expressed.

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But if those strange bodies which are driven in, whether it be
a bullet or haile-shot, doe not descend deepe into the wound,
they may be gotten out with a smal piercer scrued at the end, and
compassed about with a hollow cane of iron; which sharpe screw
shall be turned till it get hold of the lead, and so it may be drawne
out. And thus much shall serve concerning the extraction of bul-
lets, bones, peeces of iron, and other strange substances which are
driven into wounds.

Now

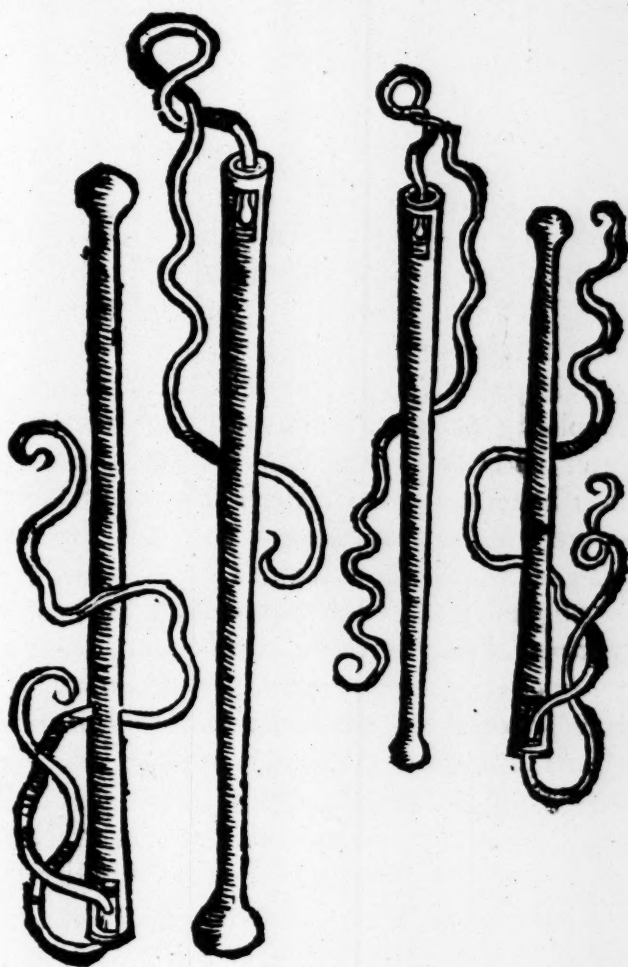
Now to search where those strange substances lye in the wound (for the lippes of the wound presently upon the stroake will close together) the Chirurgians use a Probe, round and smooth, with a smooth button at the end, and so long that it may reach to the bottome; for being smooth and buttoned, it will not violate the flesh in the search. The same Probe also they make with a needles eye, that if the wound bee through and through, they may draw a seton or a flamula through it, which they annoint with medicines fit for their purpose: or if the wound bee not altogether but neere through and through, so that the bullet cannot be drawne out where it went in, then the button of the needle serves to discover what distance there is of flesh betweene the bottome of the wound and the contrary side; and if it bee not much, they make incision, and so take out the bullet; and when that is done, they draw a seton or flamula through to facilitate the cure. So that this Instrument serves for a double, yea a triple use, and therefore you have the description of it here expressed.

And so much for the finding and drawing out of the bullets.

C H A P



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CHAP. XXV.

Of the first dressing after the Bullet is drawne forth.



When the Bullet or whatsoever strange substance is thus extracted, the next part of the cure is to minde the contusion by suppuratives, such as is the oyle of whelpes, unless there be feare of a gangrene, either because of the constitution of the ayre, or the condition of the part affected. Moreover, if the part wounded

ded bee nervous or neere a joynt where the tendons of the muscles are fastned, then in stead of oyle you shall use *Venice Turpentine*: Adde also that which *Ioubert* hath concerning wounds of this nature, that you must beware of such hot medicines as we call *escharotica*, (though they be not *Caustickes*) as well because they induce paine, inflammation, fevers, the gangrene and other like mortall symptoms; as also because when an eschar is made in the wound, all suppuration is prohibited which is most necessary in this case, for by suppuration the confused flesh is separated from that which is sound, which otherwise by contagion will be also drawne into putrifaction. Moreover, when the excrementitious humor is concluded by the eschar as by an obstacle, and resteth in the part affected, then the putrified vapours arising therefrom not having issue, are multiplied, transmitted, and diffused from the lesser vessels into the greater, and from them into the whole body. Wherefore when you have reason to suspect any putrifaction in the wound or froward inclination thereto, you shall doe well to forbear suppuratives and fly to medicines which resist putrifaction, such as is the unguent following called *Aegyptiacum*.

Recipe Pulveris Aluminis Rocha, viridis aris, vitrioli Romani, Mellis rosati, ana uncias duas; aceti optimi quantum sufficit; bulliant omnia simul secundum artem & fiat medicamentum ad formam mellis. The heate and subtile substance of this medicine affordeth it a faculty to cure and attenuate humors. It also recalls and establishes the naturall heate of the part which was afflicted and dissipated by the rapid and violent impulsion of the bullet into the body; and besides, it corrects the virulencie and contagion of the humor transported by the Contusion so farre beyond his nature that it draweth neere the nature of poyson it selfe.

You shall therefore use this medicine dissolved in vinegar or *aqua vita*, and therewith annoynt your tent or the Seton in the Chapter before spoken of, or the flammula. And at the first dressing you shall make your tents longer and thicker; longer, that they may attaine to the depth of the wound; thicker, that the wound being thereby dilated, way may be made for other medicines as cause shall require. But if the tent make not way sufficient, you may with a small syring cast in what you thinke fit: yea this medicine it self being so dissolved, may be squirted in that it may search the

the

the bottome of the wound; observe onely that in nervous parts you contemper this medicine with an admixtion of the oyles of *Terebinthine* and *Hypericon*. But if there be no suspicion of putrifaction, nor the ayre be inclined to a pestilent Constellation, you may forbear this medicine, and in stead of it apply remollient and lenient, such as is the oyle of whelpes before mentioned, which is thus con-
fected.

Recipe Olei violacei libras quatuor, in quibus coquantur Catelli duo nuper nati usque ad dissolutionem ossium, addendo vermium terrestrium ut decet preparatorum libram unam. Coquantur simul lento igne, deinde fiat expressio ad usum, addendo terebinthina Veneta uncias tres, aqua vita unciam unam. It must be applyed warme, and then it hath a wonderfull vertue to ease paine, to hasten suppuration, and to loosen an eschar: but because this medicine cannot alwaies or easily be gotten, instead of it you may use this following.

Recipe Oleorum semin. Lini & Liliorum ana uncias tres, unguenti Basilici unciam: liquefiant simul & fiat medicamentum. Of this you may issue as much into the wound as you shall finde to be fit: for being a little warmed, it eases paine, it supples and moystens the lips of the wound, and brings forward suppuration mightily, which is the maine intencion of all in these kindes of wounds, because all contused flesh must and ought to be suppurated, that new and solid flesh may be restored in the roome thereof. *Ioubert* commends the medicine following, which yet *Parvus* had not made tryall of when he wrote the Treatise of Gunshot.

Recipe Pulveris Mercurij bis Calcinati unciam unam, adipis porci recentis vel butyri recentis uncias octo, Camphora in aqua vita dissoluta drachmas duas, misce omnia simul addendo tantillum olei liliorum aut lini. Forsooth reason and experience both taught *Ioubert*, that this was an excellent medicine. For the poulder of Mercury, when it is mixed with a crasse and moyst matter, will in a short time turne contused flesh into quittance, and yet procure no great paine. As for the Camphire, it is of exceeding subtile parts, and therefore doth not onely it selfe penetrate, but is also a vehicle to transport other medicaments that they may more freely operate according to their vertues. Adde hereto that Camphire doth mightily resist corruption and putrifaction.

Now if the wound be given at hand and neere a man, it cannot be but it must be scorched because of the flame of the Gunpowder,
and

and therefore in such a case the Chirurgian shall use such medicines as are fit for that kinde of affect, and yet not neglect suppurations. As for those parts which touch the wounded part or are neere neighbours to it, I would not advise that refrigerant and adstringent medicines should be used to them, unlesse haply in the first dressing; for those that coole, weaken the part and hinder suppuration; those that are adstringent doe constipate or close up the pores of the skin, which is the cause that (the putrid vapours being concluded so that they can neither issue nor expire) the part Gangrenates and mortifies.

Moreover, if the Contusion be notable so that much flesh about the wound is brused, then it will be fit to scarifie it manifold and deepe, that the part may be unburthened of that brused and clodded blood, which if it subist will easily degenerate into putrification. As for the parts which are further remote from the wound and doe compass the Contused flesh; it shal be behoofe full to apply to them refrigerant and corroborating medicines which may stay and inhibit the defluxion of humours unto them, such as is that which followes.

Recipe Puluer. Boli Armen. sangui. Dracon. pul. Myrrha, ana unciam unam, succorum selani, sempervivi, portulaca, ana unciam unam semis. Albumina quatuor ovorum, oxyrhodani quantitas sufficit; fiat linimentum ut decet. This and such like you may use till the feare of accidents or symptomes is over blowne:

Finally, there is no lesse care to be had of the fit binding of such wounds than there is of the medicines. Above all labour to place them in an indolent situation, dresse them not above once in 24 houres at the first, till the quittance begin to issue, afterward dresse twice a day, that is, once in 12 houres, but when the quittance flowes abundantly so that it is troublesome to the patient, dresse every 8 houres, againe when the quittance begins to faile, dresse every 12 houres, when the ulcer beginnes to fill with flesh, once in 24 houres as at the beginning, and thus much of the first dressing.

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IN the second and subsequent dressings (unless there be a suspicion of putrefaction, or that the wound should Gangrenate (the cure whereof we shall entreate of after ward) you shall poure into the wound onely some of the aforesayd oyles, adding thereto the yolkes of egges and a moment of saffron, and that so long till the excrement of the wound bee concocted into quitture; which will be longer than is usuall in other kinds of wounds not made with Gunshot, because not the bullet onely but also the ayre which the bullet impetuously drives before it, by braying the flesh as it were dissipates the naturall heate and exhausts the spirits of the affected part, so that nature cannot halten her worke of concoction; besides the stench of the *sanies* and other dire symptomes which follow upon the Contusion, breake her powers and interturbe her operation. Notwithstanding oftentimes about the third or fourth day, quitture will appeare sooner or later according to the complexion and constitution of the body, and the condition of the ayre. Thence forward you shall use deterfives, adding to your former medicament some Turpentine washed in rose water or barley water to abate his biting quality. If the season bee very cold, you may doe it with *aqua vita*, or adde a little of it to the other. Your detergent medicine make after this manner. *Recipe aqua decoctionis hordei quantum sufficit, succorum plantaginis, apij, agrimonie, Centaurij minoris, ana unciam unam; bulliant omnia simul: in fine decoctionis adde Terebinthina Veneta uncias tres, mellis rosati uncias duas, farina hordei drachma tres, Croci scrupulum unum: misceantur omnia simul bene agitando, fiat mundificativum mediocris consistentie.* Or, *Recipe Succorum Clymeni, plantaginis, Absynthij, apij, ana uncias duas. Terebinthia Veneta uncias quatuor. syr. absynthij & mellis rosati, ana uncias duas; bulliant omnia secundum artem, postea colentur, Colatura adde pulver. Aloes, mastich, Ireos florent. farina hordei: ana drachmam unam: fiat mundificativum ad usum dictum.* Or, *Recipe Terebinth. Veneta lota in aqua rosarum uncias quinq, olei rosat. unciam unam, mellis rosati uncias tres, myrrha, aloes, mastich, Aristoloch. rotunda, ana drachmam unam semis, farina hordei drachmas tres: misce, fiat mundificativum.* Which medicine you shall use with tents neither too long nor too thick, least it hinder the issue of vapors as rise in the wound. For if those vapours be intercluded, the part wounded will be gnawne

(as it were) with their sharpenesse and acrimonie, whence will follow paine, new fluxion, inflammation, hollownesse in the ulcer, putrifaction and the like; all which will not onely afflict the part affected, but also be communicated to the whole body: but if so small tents as you must use neither pertaine to the bottome of the wound, nor keepe it open till the strange substances and the quit-ture are excluded, it will be very behoofefull in such sinuous and profound wounds to use such an injection as followeth.

*Recipe, Aqua hordei Libras quatuor, agrimonia, Centaury mino-
ris, pimpinella, absinthij, plantaginis, ana semimanipulum: rad. Ari-
stolochia rotunda semi-drachmas: fiat decoctio ad libram unam.
In Colatura expressa dissolve Aloes hepatica drachmas tres, mellis ro-
sati uncias duas, bulliant modicum.* This decoction you shall in-
ject into the wound three or foure times every dressing, and if that
will not deterge the sanies sufficiently and consume the spungie, pu-
trified, and dead flesh; you shall dissolve in your decoction as
much of the *Aegyptiacum* described before as you shall thinke
fit: put case an ounce of the *Aegyptiacum* to a pound of the de-
coction, for so it will eat out the spungie flesh which growes in
the hollownesse of the wound, and inhibite the growth of true
flesh which is not fit before the wound be sufficiently clenfed. For
which end also (saith *Pareus*) I have had experience, that the poul-
ders of Mercury and burnd Alume mixed in equall portions are
very excellent. Many practitioners doe usually suffer a great part
of this decoction to remaine in the capacity of the wound, especia-
lly if it be sinuous; which *Pareus* worthily disalloweth, as well be-
cause the liquor remaining makes a tension or stretching of the part
affected; as also because being so over moystened, the flesh wil not so
promptly be regenerated; for it is a rule in Chirurgery, that every
ulcer as it is an ulcer ought to be dried as much as may be, and he
that can dry an ulcer can cure it. It is also ordinary for Chirurgi-
ans to offend in the too frequent use of Setons or lines of hayre.
For changing them often and drawing them up and downe in the
wound, they hurt the tender sides thereof, bring paine upon the
Patient more than needs, and exasperates the malady, which there-
upon produces many malignant symptomes. Wherefore my coun-
sell is (saith *Pareus*) that if the wound yeeld much matter or quit-
ture, that the Chirurgians use hollow tents, so that the sanies may
issue

issue oftner than it is drest, and so Nature will be releevd with lesse trouble. He also useth to thrust downe ragges upon the bottome of the wound if it can well be com'd unto, to drinke up the *sanies*, and to presse the parts a little together, that the matter may issue; but let the Chirurgeon take heed that he leave none of the clout in the wound: the double cloathes also which he layeth over the orifice of the wound and upon his hollow tents, would have a large perforation in them, at which perforation he may place a peece of soft sponge, to receive the quittance as it issueth.

Now for the binding or rowling up of the wound, the first care must be that it be not too straight, for that will inhibite the issue of rotten vapours and excrements which the bruised flesh yeelds; beside it will endanger to bring an Atrophy by keeping the alimentary juyce from the part. Next you must take care to beginne to rowle from the bottome of the wound, and so proceede to the top or orifice; for that manner of rowling leades away the quittance better. Lastly, you shall wet your clouts and rowlers with *Oxycratum* or hard wine, for that will adde strength to the part, and beside intercept a new fluxe of humours.

And because it happeneth many times that by reason of the vehemencie of the Collision the bones are shattered into small peeces, which at the first dressing cannot bee gotten out, but remaining in the wound doe goade it greivously; I have added an excellent and approved remedy to bring away such remainders, out of *Parvus*.

Recipe, Rad. Ireos Florentia, panac. & Cappar. ana drachmas tres: Aristolochia rotunda, manna, thuris, ana drachmam unam. In pollinem redacta concorporentur cum mellis rosati & terebinth. Venet. ana uncis duabus. Or, Recipe, Resina pini sicca uncias tres, pumicis combusti & extincti in vino albo, rad. Iridis, Aristolochia, ana semidrachmam, thuris drachmam unam, squamma aris drachmas duas. In pollinem redigantur, diligenter incorporentur, cum melle rosato fiat medicamentum.

CHAP. XXVII.

What remains afterward for the Chirurgicalian to doe.



Henthe skilfull Chirurgicalian hath gotten out the strange substances out of the wound, and cleansed and purged it of the *faries* and quittance which the contused flesh did yeeld, so that now the wound growes dry, then he shall imploy all his care to regenerate new flesh and draw a Cicatrice upon it. Now because that is the worke of Nature rather than of medicine, therefore he shall take counsell of the learned Physitian how to institute his dyet, how to Physicke his body, how to proportion the cure according to the temper of his Patient and of the affected part, with such other indications as we usually govern our selves by in the like cases. For the Chirurgean shall often finde himselfe at a losse by reason of the variety of the ambient ayre and disposition of the yeare, the age, temper, and custome of his Patient, the noblenesse and sence of the part affected; to say nothing of the complication and composition of infirmities, and many other particulars which to recite belongeth not to this place. In one word, he must endeavour two things especially: the first is that the part affected be restored to his genuine and native temper: the other is, that the masse of blood doe not offend either in quantity or quality. For if these two be right, nothing else can hinder the regeneration of solid and good flesh, and consequently the union of the wound. Neither toward the end only, but from the beginning almost of the cure, the Chirurgicalian shall neede the Physitians advise for institution of dyet, for oportunity of purging and letting of blood, for easing of paine, yea in the maine scope of the cure of the wound, good direction for vulnerary potions, will be of great use. To say truth, a Chirurgean cannot walke safely alone without the helpe of a Physitian in any cure almost which he takes in hand, unlesse he be a peece of a Physitian himselfe: which skill as it is ordinary in Chirurgeons of other Nations, because they bee all or most of them Schollers; so amongst us where

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men get their skill in Chirurgery without Schollership by serving leaven yeeres apprenticeship, it is very rare, and by so much the more commendable where it is to be found. But to say something of all these particulars (because a Physitian is not alwayes at hand) will not be amisse I thinke for the information of such especially who when they know a little will bee desirous to learne more.

First, therefore for dyet: Hot and sharpe or biting things the Patient shall forbear, as wine, strong drinke, spices, salt, onyons, &c. for such doe attenuate and rarifie the humors, and make them more prone to influxion. Againe, let his dyet be very thin and slender, that so the influence of humors may be restrayned from the affected parts, for an empty stomacke drawes from the parts of the body, especially from those that are neereft unto it, and by consecution even from the outward parts; whence it is that the first dayes you shall doe best to dyet this kinde of patient very slenderly.

For purging it is necessary to keepe the body soluble the whole time of the cure, so that it answere once a day at least; yet it is safer to doe that by Clusters than by purgations, especially such as have Scammonic or Colocynthis in them, or any other vehement ingredient, for the agitation of humors will produce a new flux.

For bleeding it is to be observed, that upon a wound with Gunshot, seldome or never any great fluxe of blood followes, especially presently, because through the greatnesse of the contusion, and the vehement agitation of the ayre, the spirits are driven inward. Yea if an arme or a legge should bee shot off with a peece of Ordinance, no great fluxe of blood will instantly follow, though diverse large Veines and Arteries be broke. But afterward, to wit, about the fourth, fift, or sixt dayes, sometimes later, you shall have a flux of blood; forsooth because by that time the spirits and the naturall heate returne unto the part. Wherefore in the beginning you shall not neede to endeavour to stay the blood, but rather give way to the issue of it, for the effusion of some good quantity of blood, will free the part from inflammation and fulnesse too: and if the wound doe not bleede of it selfe, the Chirurgian shall finde it fit to

open a veine the next day after the wound is inflicted, and take away as much blood for depletion and revulsion as the strength of the Patient will beare.

Now for the mitigation of paine, the Chirurgeon must have especiall respect thereto from the very beginning of his worke. And if paine be joyned with inflammation (as most commonly it is) it may be abated by annointing the neighbour parts with an unguent made of Galts grease, nourished (as wee sayd) with the juyce of plantaine, houleleeke, nightshade and the like, The Unguent also called *unguent. diachalcitheos*, described by Galen, dissolved with vinegar, oyle of Poppy and oyle of Roses, is as effectuell as the former. In like manner *unguentum de bolo*, and many other of the same faculty. For although these be not properly *Anodynes* (which are all hot and moyst in the first degree) but cold, yet not narcotically, they will mitigate paine, because they correct a hot distemper, and doe stay sharpe and bilious fluxions, which are farre more impetuous then those that are cold.

After the use of such Repercussives, it will be profitable to apply this following Cataplasme.

Recipe Misa panis infusa in Lacte vaccino libram unam & semis; bulliant parum. Addendo oleorum violar. & rosarum ana uncias tres, vitellos ovorum quatuor; pulveris rosarum rubrarum; florum chamemeli, & meliloti ana uncias duas, farine fabarum, & hordei ana unciam unam: misce, fiat Cataplasma secundum artem. You may also on the sudden make it with crummes of bread boyled with oxycratum and oyle of Roses.

Finally, for vulnerary potions, you may goe to our Dispensatory, or make them of Plantaine, herbe Robert, Doves-foot, Comphe-ry, Dogges-tongue, Burnet, and the like. And so much of wounds made by Gunshot.

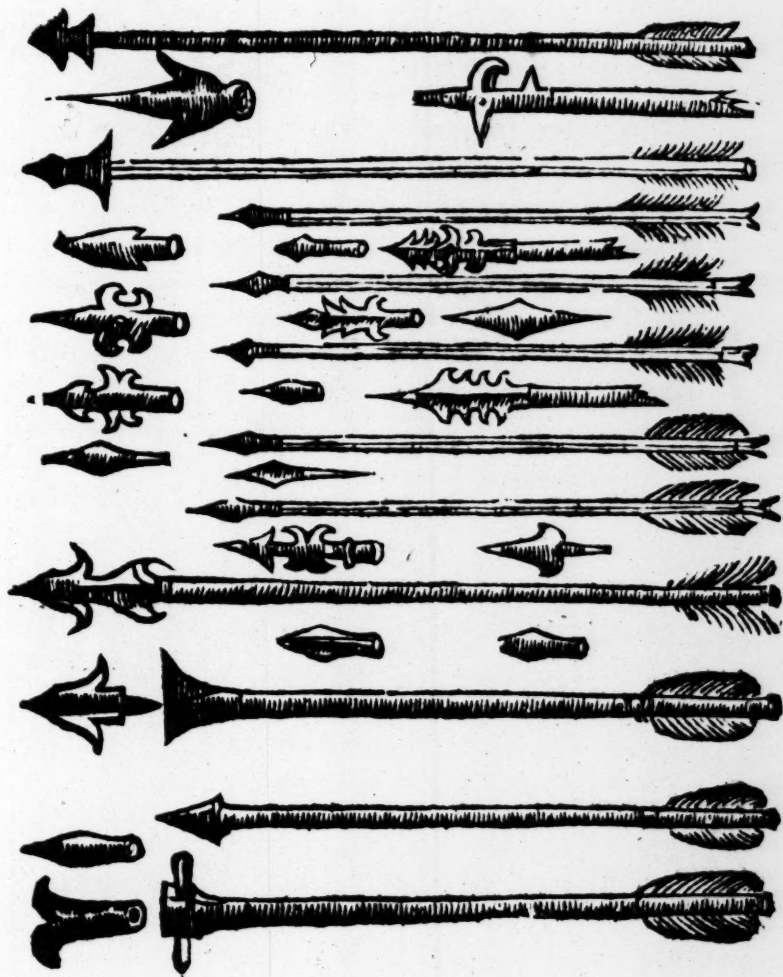
CHAP. XXVIII.

Of wounds made with Arrowes, Darts, Iavelines and other such sharpe weapons.

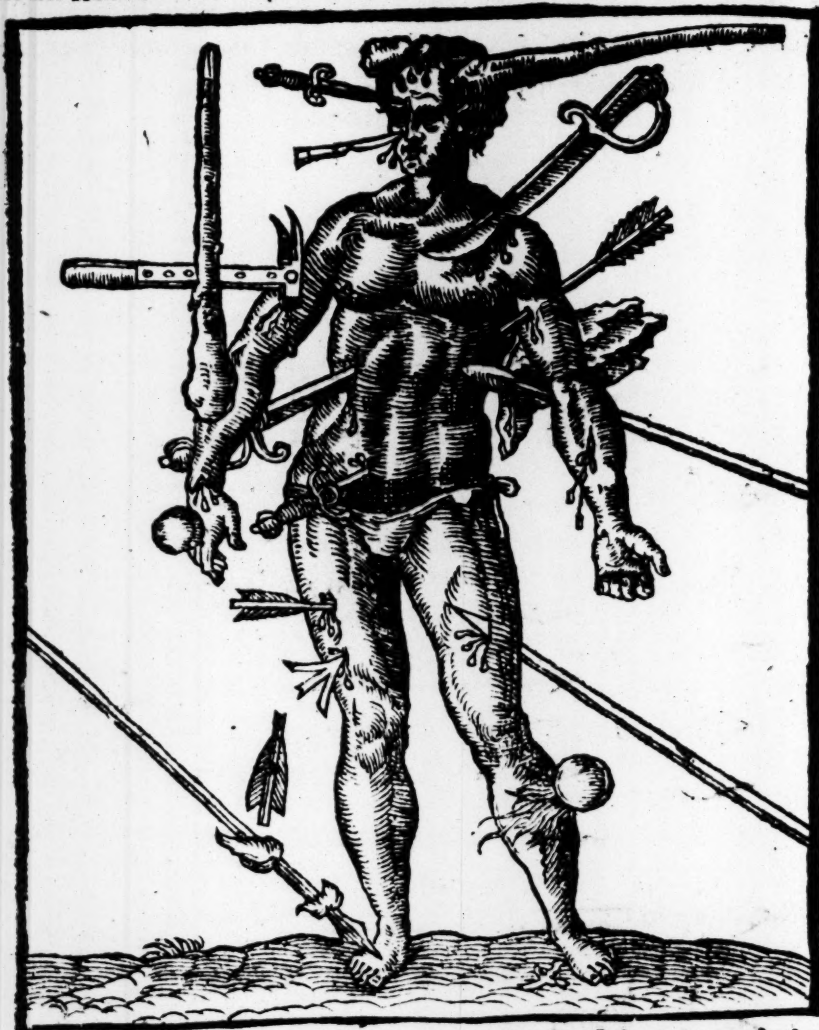


Here is a great difference in the cure of wounds made with Arrowes and sharpe weapons, and those made with Gunshot. For the bullet wounds alwayes with contusion, the Arrow or Iavelin, or the like, not so. Beside,

side, the Bullet is seldome or never poysoned, the Arrow often But among sharpe weapons there is great variety which also makes the Care various in some degree. I will not stand to enumerate the severall sorts of weapons, or make any curious division of them; onely I will exhibite to you in one figure a multitude of their fashions especially of their heads, which will bee better than any description I can make of them.



Beside, you have here expressed the figure of a man wounded with all kinde of Weapons, and in every part of the body.



Again, there is great difference in respect of the wounded part, whether it be fleshy, bony, nervous, in a joynt, or neere a joynt, or farther off, in a noble part: as the braine, the Longues, the Heart, the Stomacke, the Liver, the Guts, or such like; or in a part more ignoble; in an inward or an outward part, and according to these differences, such wounds are more or lesse mortall. In all mortall wounds it shall be for the honour of the Chirurgian and his Art, to foretell the danger. Yet not to leave any thing unattempted which may give hope of recovery; because as in diseases, so in wounds,

wounds, it falleth often out, that what the Physitian or Chirurgian gives over as desperate, that either some good old Wife, or which is worse, some cheating Mountebanke will take upon him to cure: and if he, while time, with a little herbe *Rebers*, till Nature prevaile over the disease (which many times she doth above and against our expectation) then he is famed for a second *Æsculapius*. Howsoever, it is a great disparagement to a Chirurgian, if he be called while the Patient lives to let him dye with the weapon in his body, yea as much honour may be gotten by the Artificiall getting out of the weapon in a desperate case, as by curing him that is not desperately wounded. It shall not therefore bee amisse, a little to insist upon the Artificiall extraction of such weapons.

And in the first place, the Chirurgian must bee forewarned that he take care he doe not his worke butcherly, with too much cutting or tearing the flesh, but especially veines, arteries, nerves or tendons, least it be sayd of him that his hand hath done more harme than the weapon, which would be an extreame dishonour to him and to his Art.

But to the matter. There be two wayes to get out a weapon: one by the way it went in, and that wee call extraction; the other by the part which is adverse, and that wee call expulsion.

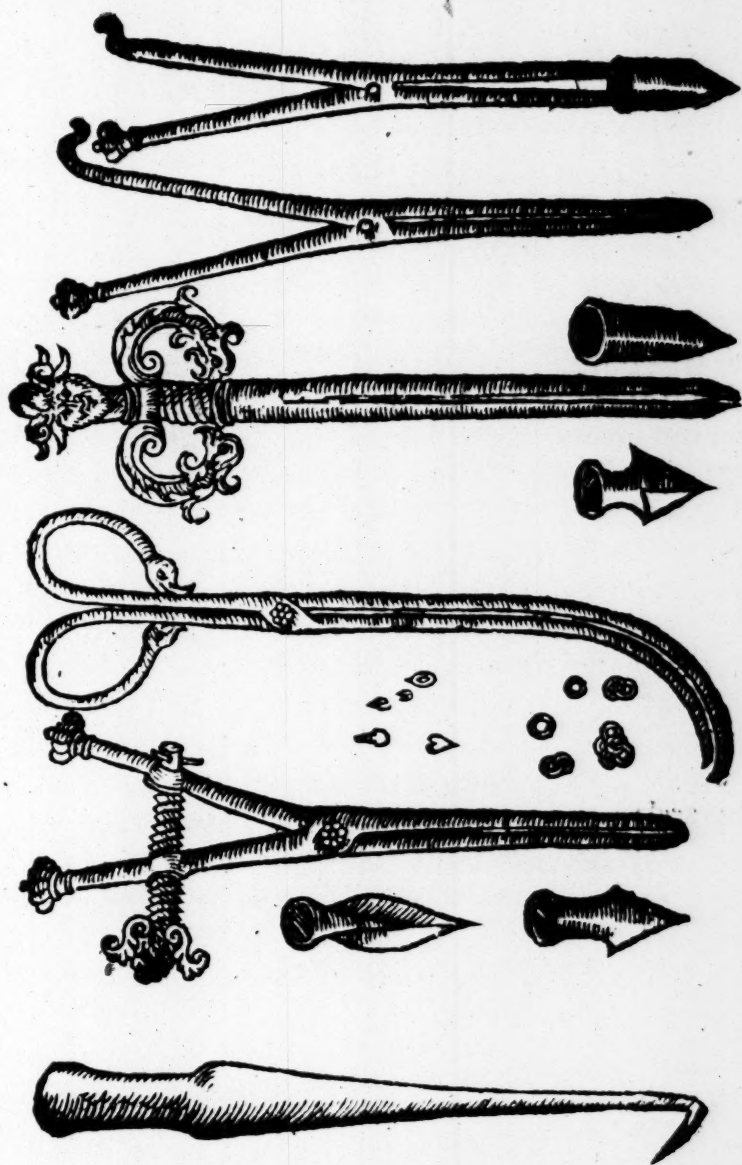
After the very first dressing, these workes must bee done, and with more ease and felicity performed if you place your Patient in the same posture hee was in when hee received the wound, as hath beene before signified. Againe, you shall have at hand all your Instruments, as for example: A paire of Pliers whose handles when you presse together, the shankes will bee divided; those are fit to take out an Arrow head, or the head of any weapon which is hollow; for the shankes being divided in that hollownesse, will hold the Arrow head firme and fast, and so draw it out. The next is a hollow Instrument of Steele like a Cane cloven in the length, in which runnes a slender and sharpe probe, and at the handle a large screw answerable to the hollownesse of the Cane of Steele: this screw doth not onely serve to divide the cloven Cane, which by that meanes fills the hollownesse of the head of the Iavelin

lin or such like, and so drawes it out as the former Instrument did, but also if a peece of the wood remaine in the head, it presses the sharpe probe into that wood, and so drawes it out.

The next is a paire of small plyers, a little compassed at the end, and toothed within; that if the wound be oblique it may attaine to the bottome of it, and moete with any small peeces of its mayle or the like, which lye there, and bring them away. The next is a paire of plyers, with a screw running crosse the shankes of the handle, but the end of the plyers is like the Crowes Bill, or a little flatter. This screw in the handle doth open & close the Crowes Bill, as you please to take hold of the head of the weapon, though it be buried in the flesh. Lastly, it may happen that some peeces of a Linke, of a Chaîne, or mayle, may be in the wound, and then you may use a hooked probe to draw them out; and this Instrument is also usefull sometimes in wounds made with Gunshot, where such rings or peeces of mayle are driven into the wound. The figure of all these Instruments, you have hereunder expressed in the order I have described them, for in *Pareus* the descriptions are mistaken.

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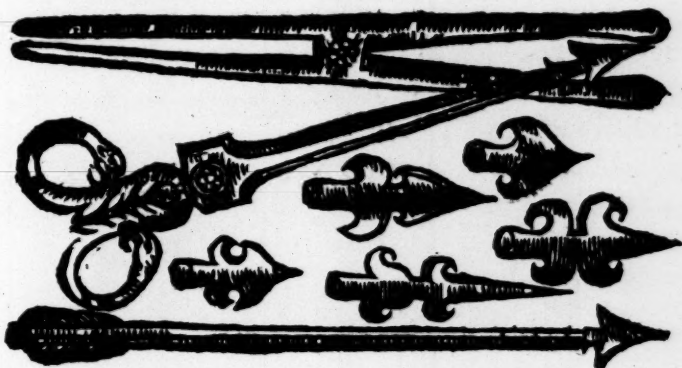
Now if the head of the Pike, Iavelin or Arrow bee broken off short and remaine in the wound, but not to be seene, or easily to be felt; yet you shall know were it lyes by a roughnesse and inequality which you shall discerne by your probe. The flesh also will be brused and appeare livide or blackish, and the patient will finde a heavie paine in that part of the wound, though the weapons head be

be so bended in the place, that it doe not alwayes pricke and goade him. As sometimes the stone that falls from the kidneyes, after it hath with wonderfull torment extended the ureter, will be bedded therein, and goade no more till it moove againe: and yet the patient will finde a heavie and gravative paine about the place where in it resteth. Wherefore when any of these signes shall put you into suspition that some part of the weapon is remaining in the wound, use your best skill and most proper Instruments to finde it, and to draw it out. And if you must of necessity use incision, doe it as carefully as you can, and avoyd the vessels and tendons of the muscles, if it be possible, which that you may doe, your skill in Anatomy will guide you, whereby you shall know what large vessels runne in any part, and where the tendons of the muscles are, and after you have made such incision as is of absolute necessity, performe the other part of the worke which is to draw out the weapon, with your toothed or rough Bills or Beakes, of which I have before intreated. And this manner of incision you shall be most constrained to use, when the head of the weapon is not plaine but indented, bifurcated or bearded like a crosse or broad Arrow, such as our *English* men shot of old out of Long-bowes, and now we use to shoote at Deare. But here you shall observe the second manner of getting Arrowes &c. out of a wound, called expulsion; and that is, when either it pierceth so deepe, that it is neere the adverse part, and with a small incision may there bee drawne out, but cannot be extracted by the way it went in without great difficulty; or when the head of the weapon is so forked or indented, that if it be extracted, it will rend and teare all before it. In both these cases it may be expelled or driven out with your blunt or knobbed probe, at the adverse part, you having by convenient incision before, made way for it. And to say truth, beside the necessity of this impulsion, the conveniencie of it will countervaille the incision, because when the wound is through and through, it will be more easily deterged and after consolidated.

But if the adverse part to the wound, upon which the head of the weapon doth rest, be a bone; or if many tendons of Muscles or much flesh must be cut to make way for impulsion, as it hapneth in the brawny parts of the body; then you shall worke by way of extraction, dilating the wound first with the Instruments fit for

that

that employement, forbearing the Nerves and larger vessels as much as you can, according to your skill in Anatomy. With a dilatatorie hollow in the inside, you shall be able to comprehend both the beards of the Arrow head, or the like; and then with the Cranes bill before prescribed, you shall take fast hold upon it, and so drawing out both your instruments together, you shall together with them draw out the weapons head. The manner of this operation you have deformed in this subsequent figure.



Observe also that if the point of the weapon be fixed in a bone, you must gently shake it; gently I say, for feare you breake the sharpe point of it, and leave it in the bone; and when you have posined it by such gentle shaking, then with the Crowes Beake, or the like, you shall endeavour to draw it out. When it is out, you shall presse out the blood, as you may; and if much blood follow, you shall so farre suffer the fluxe to continue as the strength of the Patient, and the condition of the affected part will permit; for so you shall secure it from a plenitude, and from a *Cacochymia*, and beside it will be lesse subject to paine, inflammation, putrifaction, and such other symptomes as you feare might grow upon you in the Cure. But if those symptomes overtake you, then musty you flye to the remedies before appointed.

Finally, although it be not usuall that weapons should be poysoned, yet because the malice of men is sometime so exalted that they are bent upon all mischeefe they can devise, you shall learne to know when the weapon is poysoned, and how to behave your selfe in such a case. You must therefore understand that weapons are

are almost alwayes poysoned with hot poysons, seldome or never with cold, That they are poysoned with hot poyson, you shall perceive as wel by the propriety of the paine, as by the condition of the wounded flesh. For the paine, first it is beyond measure greater than the paine of wounds not poysoned. Secondly, whereas the paine of other wounds is most what gravative and dull, that which proceeds from hot poyson, is pricking, like the continuall stinging of a Bee, we call it a stinging paine. The wounded flesh will also discover the poyson with a pallid and livid colour, together with some signes of mortification, beside many other malignant symptoms which doe not usually accompany wounds of a simple nature. In this case as soone as the wound is cleared of the weapon and all strange substances, you shall scarifie round about the wound frequently and deepe, and after set on Cupping-glasses, with a great deale of flame which may draw mightily, that the poyson may be exhausted: you shall also get them sucked by a man or woman whose mouth and pallat is sound and not ulcerated, and you shall let him or her hold a little oyle in their mouthes least the poyson offend them. Lastly, you shall powerfully call out the poyson with Phenigmes, Vesicatories, Canteries, and all other manner of outward applications which your Art shall suggest unto you, which belong not to this place.

CHAP. XXIX.

Of the nature of a Gangrene.



Because I have oftentimes in the former discourse told you that wounds with contusion are subject to Gangrene, I resolved in this place to say something of that also, though I know that this subject would require a whole Treatise by it selfe; but I am onely at this time (as I have often sayd) in the explication of Instruments, and if you meete with any other Tackling by the way which may serve you to turne, understand it to come by the bye not by the maine, and of *Parous* for the most part, as also all the rest.

A Gangrene therefore upon a contusion, comes sometimes by

the fault of the Chirurgian, sometime through the error of the Patient, sometimes from the vehemencie of the contusion, but most commonly from the condition of the part affected; of all which we shall understand the causes better, if we first describe the nature of a Gangrene.

A Gangrene therefore is a disposition and way to a mortification of the part wherein it is, which creepeth upon it by degrees, and when it is consummate it is called *Sphacelus* by the *Grecians*, by the *Latines*, *syderatio*, we say such a part is mortified.

The most generall cause of a Gangrene is the dissolution of the Harmony and contemperation of the foure first qualities whereby the part is made unfit to receive the spirits and faculties, as well naturall as vitall and animall, by which it is nourished, by which it lives, moves, and hath sensation; for if a part be deprived of these influences it presently languishes and shortly after dyes.

The Primitive or externall causes hereof are combustions made by things which are either actually or potentially fiery. Actually as fire it selfe, scalding Oyle or Water, Gunpowder fired and such like. Potentially, as biting and goading Medicines, put case sublimat *Calcanthum*, and Potentiall Cauteries; for all these raise a mighty inflammation in the part. In like manner vehement perfrigerations by the ambient ayre may bring a Gangrene, as also the unseasonable use of cold and Narcoticall Medicines. Moreover, a Fracture, a Luxation, a notable Contusion as I sayd before; Ligatures if they be too hard and fast; the bitings of mad or poysonous beasts, the pricking of a Nerve or Tendon, the wounds also of nervous parts and of the joynts, especially if the body be *plethoricall* or *cacochymicall*: Finally, large and deepe wounds wherein the larger Veines and arteries are cut asunder. For all these causes doe more or lesse, sooner or later, dissolve the harmony of the first qualities before mentioned, if the mischief be not seasonably prevented.


The internall and (as we call them) Antecedent causes of the Gangrene, are the plentifull confluences and defluxions (and those sudden) of hot and cold humors unto a part. For the faculty of the part being not able to governe them, it commeth to passe, that the imbred heate for want of transpiration is suffocated and extinguished. For by this defluxion the Arteries are so straightned, that they

they cannot dilate and contract themselves by ordinary pulsation, whereby the naturall heate is cherished and contempered. But then especially is the Gangrene most incurable when that defluxion of humors, seases first upon the bone and from the bone the inflammation takes his originall. Yea, the bone is not onely first, inflamed (I meane the *periostion* which covers it) but also the very substance of the bone is at the first hand tainted with a caries and rottenesse, as in the *French* disease and the Leprosie; especially in the *French* disease you shall have a mans flesh plumpe and found, and his skinne faire and smoothe, and yet his bones rotten, and as it were worme-eaten. And this alwayes from a venemous matter which lyes dogging and gnawing upon the bone. And this poysonous matter is sometimes hot, as in Plague-sores which will Gangrenate now and then within few houres; sometimes it is a cold poyson, as the poyson of the Pox (which is not so quicke) and other secret poysons setting in particular parts, whereof out of *Pyæus*, I could give divers instances, one of mine owne experience you shall have. A Gentlewoman of *Norfolke* made great complaint to me of a paine in her forehead, yet there appeared no inflammation or tumor, within two or three dayes in the middle of her forehead appeared three blew spots as big as Pease, and in other two or three dayes, they grew blacke but no bigger, and the mortified flesh fell out to the very skull, and suddenly healed up againe without any more trouble. I perswade my selfe this sudden mortification could proceede from no other cause but some poyson, which issued out at the Commissure of the skull, which is called the sagittall suture, and in women divideth the bone of the forehead.

I say not that such a sudden Gangrene cannot proceed from any other cause but from poyson. For it is not extraordinary, that it should come from the temerarious use of Narcoticall medicines, sometimes also from the keene and penetrable cold of the ayre in Winter, whereby the spirits and naturall heate of a part is utterly extinguished, and the influent heate beaten backe. For when a part is so frozen, the influent heate cannot pierce it; or if it doe, it cannot remaine in it, but is beaten backe or arrested and put out. Note here that the Gangrene which proceeds from extreame cold, doth especially occupy those parts which are farthest off from the heart which is the source of heate, as the feete and the hands, or

else those part which are of their owne temper cold, as the gristles of the eares and the nose.

CHAP. XXX.
Of the signes of a Gangrene.

 He nature of a Gangrene thus explained, we come to the signes. If therefore it proceed from an inflammation or phlegmone, the paine and pulsation will cease without just cause, that is to say, without resolution, or suppuration of the tumor, and the flaming and ruddy colour of the part will suddenly grow browne and livid. By pulsation here I doe not meane onely that beating which proceedeth from the distempered Artery; but that dolorous beating which is begotten by the contention betweene the naturall and preternaturall heates, which contention proceedeth from certaine crasse vapours arising from the humors which the Gangrene shuffeth up and downe and setleth a bad impression upon. If the Gangrene proceede of cold, then presently and upon the sudden, an acute pricking and burning paine invades the part; for *penetrabile frigus adurit*, as the learned Poet saith. Another signe is, if the fresh and bright rednesse of a part, such as will appeare in a mans hand that rowles a Snowball, be suddenly turned livid and wan. Again, if in stead of an extraordinary heate that was in the part, presently it becomes cold, nummed, stupid, and that not without a sensible horror, as if it were sealed upon and shaken by a cold fit of a quartaine Ague. If this cold increase so farre that it utterly extinguish the naturall heate, then a mortification will follow upon that Gangrene; and beside, oftentimes convulsions and violent concussions of the whole body, whereby the braine and the vitall parts are grievously disquieted.

Those Gangrenes which come upon too hard Ligatures, upon Fractures, Luxations, and contusions, have alwayes an hardnesse accompanying them, which is caused by attraction and incursion of humors. Many times certaine pustules and blebs rise upon the skinne confining, which are caused by a notable ardor not farre from a degree of combustion. The member also Gangrenated, is more heaue and weighty than of due it ought to be, because there

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is want of spirits to ballance and poyse the Moles or mountenance thereof, and to support it. Againe, if you presse a Gangrenated part, somewat hard with your finger, it will leave a print and footstep behinde it, as it doth in an *Oedema*, proceeding from the dropsie, or the like disease. Finally, in a Gangrene, the skin without any iust cause, will easily shire from the flesh, yea, sometime the whole and true skinne, not the cuticle onely.

If the gangrene proceede from the biting of a mad Dogge, or of any other venemous Beast, the pricking of a sinew, the breaking as it is called, or rather the extention of an Artery called *Aneurisma*, or from some notable wound in a phlethorick body, or which is oppressed with a *Cacochymia*; or in a part of exquisite sense, all these Gangrenes shall be discerned by the same signes, by which we discern a Gangrene proceeding from inflammation, of which I spake before. For these and the like causes, doe cause attraction and fluxion of humors, into a part more than the ingenie of the part will beare, or can moderate and regulate, and so perspiration being intercepted, and the pores stopped, there followes necessarily an oppression and suffocation of naturall heate and a Gangrene which are tearmes convertible.

Here, saith *Pareus*, I would admonish the yong Chirurgian (he might have put in all) that when from these signes before named he knowes the place is Gangrenated, and that a Necrosis or mortification will follow (for that I presume is his meaning) that he doe not protract time, but as soone as he can prepare himselfe and his Patient, that hee proceed to Amputation or dismembring, although there remaine some sense in the part, or some small motion. For oftentimes in this case, the member is not moved by the motion of the whole muscle, but haply the head of the muscle is not yet gangrenated, which sound head, whilest it moveth it selfe it also moveth the tendon or taile of the muscle which is continual with it although it be already mortified. Wherefore to delay in such a case is dangerous. But of this we shall speake further by and by. In the meane time, I will adde something of the Prognosticke which a Chirurgian ought to give upon a Gangrene. For, as in all other desperate Cures, it becomes him well to declare the danger his patient is in, to secure his owne reputation, and to asseure the honour of his Art, which lies at stake as well as his credit. Specially,

especially in the case of a Gangrene, the rage and malignity of which disease, is so great, that it will out of hand, not onely kill the part affected, but by contagion also seale upon the neighbour parts, and in time upon the whole body. For a Gangrene is a very poyson which turneth all it meets with into his owne nature, or if you will, like fire (though not so like) it eats, feeds upon, and depopulates whatsoever comes into his way. Againe, *Hippocrates* in his booke *De vulneribus capitis*, saith; *There is no proportion betweene the Living and the Dead*. And therefore you must say, that the dead part must presently be separated from the living, *Ne pars sincera trahatur*. Moreover, when your Patient shall have a cold sweate arise upon his whole Body, when a *delirium* takes him, and that he cannot sleepe, when the Hickocke and abrupt belchings come upon him; finally, when he is overtaken, with frequent returning, faintings and swooundings, then you may prognosticate, that death is at the doore. For all these symptoms are caused by vapours which arise plentifully and perpetually from the corruption and mortification of the humors and the flesh, through the veines, arteries and sinewes, unto the noble parts. Finally, when thou hast thus provided for thy owne reputation, and the honour of thy Art, by acquainting the friends of thy Patient with the danger; then if thou finde any hope at all of curing or intercepting the progresse of the maladie, hasten to thy worke.

CHAP. XXXI.

Of the Cure of a Gangrene curable, before it come to perfect mortification.

THe Indications of curing Gangrenes, are taken from their variety, I meane of their essence and magnitude, For some Gangrenes occupy a whole member, others onely a part of a member; some are profound and deepe, others outward and superficially. The state of the body is also to be considered: for soft and delicate bodies, as are the bodies of Children, Women, Eunuches, and those that live idly, doe require more milde and gentle medicines, then those

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bodies

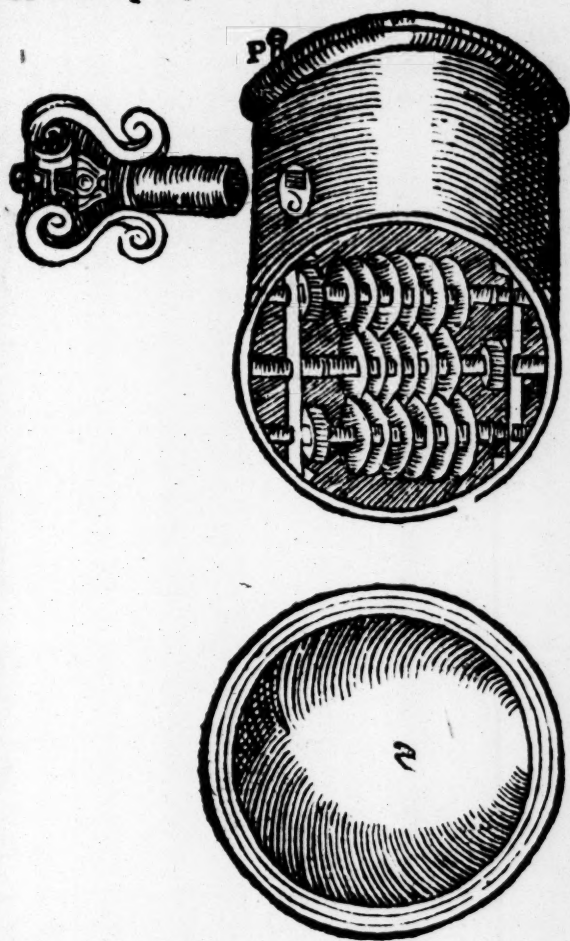
bodies which by Nature, Customs, and Trade of life, are stronger and harder, as of Husbandmen, Laborers, Marriners, Hunters, men or Hunters, Porters, and such like; who live thriftily and courselly. Againe, there is consideration to be had of the affected part, for there is a difference to be made betweene the Cure of Gangrene in a fleshy and musculous part, and in a solid part, as those which are nervous, and in, or about the joynts or the bones. Moreover, such parts as are hot and moist, as the secret parts, the mouth, the wombe, and the fundament, are more easily and sooner tainted with this manner of corruption, & therefore you may sooner apprehend the danger, and consequently with more speed set upon the Cure. And first of all if the Gangrene proceed from inward causes, you shall call for the advice of a Physitian to prescribe his dyer; as also if the body be plethoricall or Cacochymicall, to advise concerning Letting of Blood and Purging. The heart also must be fortified and corroborated to defend it against the Translation of vapours arising from the affected part, by inward Cordials, and outward applications, as Epithemations, and the like. All which I leave to the care of the Physitian.

But if the Gangrene proceed from a plentiful influxion of blood or humors, as upon a great phlegmone, or the like, the cure shall be begun by evacuating and drying up of humors which have putrefied in the pained part. To this purpose, you shall use scarification & incisions, deeper or more superficially, as the condition of the gangrene shall require, that the part being so exonerated, may have the benefit of perspiration, & the concluded humors, of diffusiō, & vent made for the fuliginous and sooty excrements which abound in it.

Incisions you shall make with the Phlegme or Penknife, deep and manifold when the Gangrene is great, profound and neare to mortification: As when it reacheth neare the bone: yet you must have great care to avoide the most notable Nerves and Vessels, unless they be utterly mortified, make your sections in the distances betwixt them. If the Gangrene be lesse, you shall be contented to use onely scarifications. For this purpose *Parvus* hath an instrument which he calleth the *Scarificator*. It is a box, wherein are fastened many rownd wheelles as it were, sharpe as phlegmes, which by a handle fitted into the side of the box are made to strike all together, so that with this instrument you shall make as many scarifications at once as the phlegme will doe at many times, & beside,

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of one depth. The instrument with the cover is hereunder expressed.



When scarification is thus made, then shall you foment the part with wine-vineger, wherein you shall boyle Radish rootes, of *Serpentaria major*, of *Arum*, & *gillum Salomonis*, *Auripigmentum* and the like. For these sharpe medicines doe powerfully warme, resolve, and draw the clodded blood from the bottome into the skin w^{ch} otherwise will interclude the passage of the spirits, whereby the integrity of the part is preserved, and beside, extinguishes the naturall heate. But in this administration you must bee very cauteulous, least together with the clodded and grumous blood, you draw also the blood out

of the veines. Againe, you must be carefull you use not these drawers till you be sure the influxion of blood is stayed. If the contusion be but small, you shall dissolve Virgine waxe with Cumine seede, Cloves, and the roote of our Ladies scale. The Emplaister which followes doth powerfully, discusse grumous or clodded blood.

Recipe Picis Nigrae uncias duas, Gummi Elemi unciam unam semis, styracis liquida & Terebinthina com. ana semi. unciam, pulveris sulphuris vivi unciam, Liquefiant simul, fiat Emplastrum, extendatur super alutam.

Sometimes you shall finde that upon scarification the blood will issue freely of it selfe; suffer it on Gods name so to do, till you thinke the part is well unburthened, then foment it with medicines which will warme, dry, resolve, deterge and open; all which faculties will

chastice and correct the putrifaction. Let them also be penetrant to consume the virulence which is infixed. For that purpose make Lotions of the Lee which is made of the Ashes of the Oake, wherein you shall boyle *Lupines* till they be very tender. Or for more expedition, take salt water and in it boyle *Aloes* and *Egiptiacum*, and adde a little *aqua vite* in the end of the decoction, for *aqua vite* and *Calcanthum* burnt into ashes, are singular remedies for the Gangrene. Or,

Recipe, aceti optimi libram unam, mellis Rosati uncias 4. syrupi acetosi uncias tres, salis communis uncias 5. bulliant simul, adde aqua vite semilibram. Wash the part often with this water, for it is of great vertue to inhibit the spreading of a Gangrene. After this washing you shall lay on pledgets with *Egiptiacum*, and also with your Probe presse them into the incisions if you have made any, and that will mervailously repress putrifaction, and inducing an Eschar, will separate the rotten flesh from that which is sound. For in this case you must not expect till the rotten flesh separate of it selfe, but if you perceive any part of it to be corrupted, you shall with your knife or sheeres cut it off; after put in *Egiptiacum* as often as neede shall require, and how often neede shall require you shall discern by the colour, smell, and sensibleness of the flesh. The *Egiptiacum*, whose vertue I have often proved admirable, saith *Pareus* in such cases, is thus made.

Recipe. floris aris, Aluminis Roch. mellis communis ana uncias tres, aceti acerrimi uncias quinque, salis Com. unciam unam, vitrioli Romani semionciam, sublimati pulueris drachmas duas, bullant omnia simul ad ignem, fiat unguentum.

After you have insinuated the *Egiptiacum* into the incisions, lay on the following *Cataplasme*, for it stops putrefaction, it resolves, deterges, dryes up the virulent sanies, and by reason of the dry tenuity and subtility of the parts of it, it pierces deepe into the member, corroborates it, and beside, it is an *Anodyne*.

Ricipe, Farina fabarum, hord. orob. Lent, lupi. ana semilibram, salis com & mel. rosat. ana uncias quatuor, succi absinthij, marrub. ana uncias duas semis; aloes, mast. myrrha & aque vite, ana uncias duas, oxymelitis simp. quantum sufficit: fiat Cataplasma molle secundum artem. Above the Gangrene you shall lay this defensative to repress the influxion of humours into the part, and the vapours from


from ascending from the rottenesse into the whole body.

Recipe, Olei rosati & Myrsillorum, ana uncias quatuor; succorum plantag. solani, sempervivi, ana uncias duas, Album. ovorum quinque, Boli Armen. terra sigillata subtiliter pulveriz. ana unciam unam; oxy- crati quantum sufficit: misce ad usum dictum. All these applicati- ons must be oftentimes renewed: But if the disease be so stubbornne that it will not yeeld to the medicines above described, then you shall proceede to Cauterics; after the application whereof *Galen* commands that you apply the juyce of Leekes wherein beaten salt shall be dissolved. This is a penetrating and desiccating medicine, and therefore is avaleable to resist putrification.

If the Cauterics do no good, then must you arise unto the ex- treame remedy of all, and that is amputation of the Gangregated part; but first be sure you understand sufficiently that the part is mortified, for it is no small error if upon your mistake a man lose a member unnecessarily. Wherefore before I come to the manner of Amputation, I shall brcefsely set downe the signes of perfect mor- tification.

CHAP. XXXII.

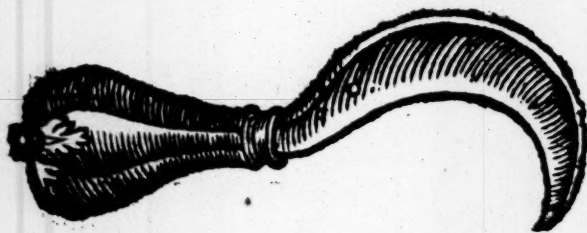
Of the Art and manner of dismembring.

N the Art of dismembring, the first consideration to bee had, is of the strength of your Patient; wherefore you shall consult with the Physitian to nourish him with meates of good juyce and of easie concoction and which breede many spirits, as the yolkes of egges, bread tossed and put into good wine. Then you shall place him decently and securely, and gather up the sound parts of his body, and then binde the part with a fast and some what painefull ligature, a little above the place where the incision shall be made, and the band shall be strong and somewhat broad like a womans fillet. This ligature hath a threefold use: the first is, that it holds the muscles together with the skinne somewhat up, which after the worke administred fall- ing downe, cover the extremities of the divided bones, and after the Cicatrice is induced, become like a quishion to keepe them from offence: adde hereunto, that by how much more flesh and skinne there is about the extremity of the bones, by so much the sooner will the Cicatrice grow upon them. The second

benefit of the ligature is, that it prohibits the fluxe of blood by compressing and intercepting the continuities of the veines and arteries. The third is, that it brings a stupor upon the part, and takes away for the time that quickenesse of the sense which otherwise it would have, by intercluding the passage of the Animall spirits, so that the Patient feels not the paine of the incision so much as otherwise he should.

When the ligature is thus fastned and the sense of the part therewith a little nummed, then with such an Instrument as is hereunder described, made keene and sharpe for the purpose, you shall suddenly circle the flesh about to the very bone.

A hooked knife fit to dismember with.

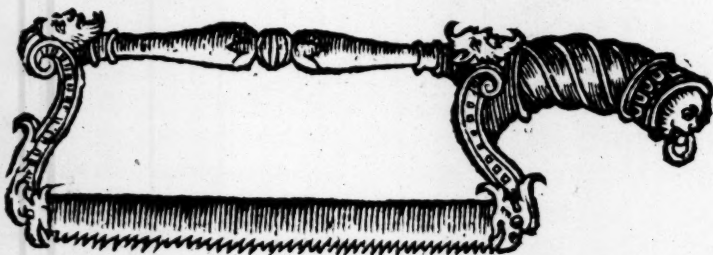


Note heere that sometimes among the bones there lyes some parts of the muscles which you cannot easily come at with this Instrument,

nor with an incision knife. If there be any such, you shall divide it as well as you can, and separate it from the bone, because if you leave it to be divided from the bone by the Saw, you shall put your patient to great paine, for the saw will be cloyed therewith.

As soone as you come to the cleare bone, set on your Saw, which shall be made after this manner, and about fiftene inches long.

The figure of the dismembring Saw.



A stroke, two, or three (if the saw bee good) will dispatch the businesse, & then you shall have a fine Raspe in a readinesse, wherewith you shall levigate and make smooth the asperitie and roughnesse which the Saw made upon the bone.

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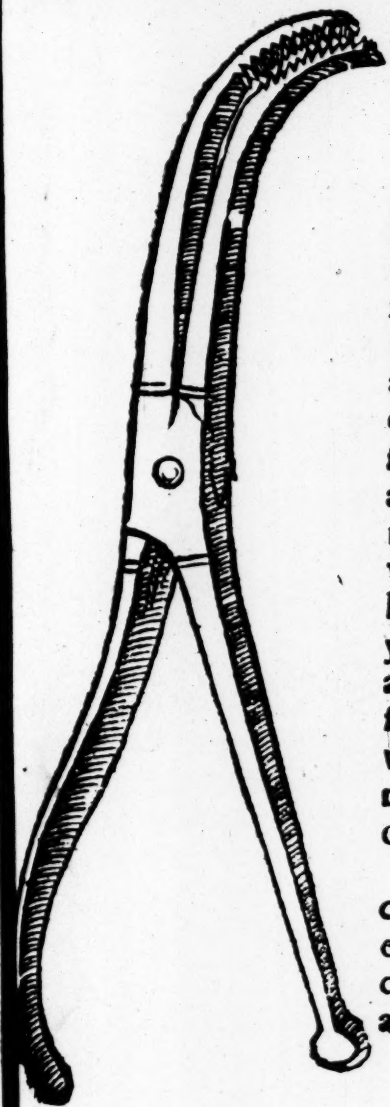
The flux of blood which shall follow the operation, you shall not suddenly stay or inhibite, but suffer it to flow according to your Patients strength, that the part may be lesse subject to inflammation and other symptomes.

When you would stay the blood, you shall with this Instrument which is most like the Crows beak, apprehend the ends of the vessels which you shall finde among the flesh of the muscles; and it shall not matter much though with the vessels you comprehend with your instrument some of the flesh also; for there will follow no danger upon it but rather a profit, because the flesh will helpe to consolidate the vessels.

The Crows Beake to draw the vessels out of the flesh, that they may be tyed up to stay their bleeding.

When you have so gotten hold of the vessels with this instrument, you shall tye them with a double and strong thred, and then loosen the Ligature you make above the place of the amputation: next with a sharpe needle and a thred, you shall with foure stitches, but taken deepe into the flesh, and crossed aslant like the letter X, sew up the flesh and the skinne somewhat loosely to cover the end of the bone, that it take not the ayre. For if you should endeavour to draw it close; and make the skinne meete, your stitches would breake, and your work would be interrupted; beside, way must be left for some quittance to issue, or else the wound will not heale.

But if by chance, or for want of care, any of the vessels which you tyed bee loosned, then you shall againe cast on your Ligature with the fillet above the incision, as you did before;
or



or else let your servant with both his hands so compasse the member, that his fingers may stop the flux of that loosened vessell, which he may well doe if you have skill in Anatomy. Then shall you your selfe have a needle ready about foure inches long, square, and with sharpe edges, and in it a strong thred three or foure double, with which you shall knit the loosned vessell. After this manner as I expresse *Pareus* his relation. First, you shall marke where the vessell lies, and enter your needle on the outside of the flesh, opposite to it, and somewhat deepe, but halfe a fingers breadth, wide on one side, and guide your needle obliquely towards the vessell, that it may issue againe immediatly beyond the orifice of it; then enter your needle againe within lesse than a strawes bredth where it first issued, and guide it obliquely under the vessell through the flesh (somewhat deepe likewise) and issue it a whole fingers bredth from the place where the first stitch entered; so shall you have the two ends of your thred on the outside of the flesh, and a fingers bredth distant. In that distance, you shall lay a pledget of a fine ragge, twice or thrice double, and then knit the ends of your thred in a fast knot upon the pledget, straining them a litle, and that straining will so comprehend the vessel that it cannot bleed. Beside, the pledget will keepe the knot from penetrating the flesh, and you shall not doubt but the mouth of the vessell will grow quickly together to the flesh, that there will be no feare it should grow againe. Or if a few drops of blood fall, you shall be assured they come not from that, but from some other small vessell which will also be easily inhibited by the application of those adstringent medicines which we shall in the next place speak of.

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CHAP. XXXIII.

What the Chirurgion must doe after the member is cut off.



First, he shall strew upon the wound an Emplastick poulder, and upon it a pledget of dry Lint. The Poulder shall be thus made. *Recipe Boli Armeni uncias quatuor, farina velatilis uncias tres, picis res. uncias duas: in pollicem omnia redigantur & ex mixtis fiat pulvis.*

When you have thus dressed up the wound, in the next place you shall provide a defensative for the member, which may repell the concourse of humors which otherwise would flow to the wounded part, and that you shall make in forme of an vnguent; after this manner.

Recipe Albumina ouorum vi. boli armeni, sanguinis draconis, gypsi, terra sigillat. aloes, mastis: Gallarum Comb. ana uncias duas: in pollicem redigantur omnia & bene agitentur addendo ol. rosarum & mirri: ana unciam: fiat defensivum ad formam mellis.

This vnguent shall be administred with stupes moystned with oxycratum, which stupes shall be so large, that they may not onely cover the member it selfe, but also the neighbour parts. As for example. If the Leg be dismembred in the place I before mentioned, yet you shall lay your defensative to the top of the knee; yea, and above it too, it will not be amisse, for this medicine is not onely repercussive, but it will also strengthen, it will contemper the blood, ease paine, and prevent inflammation.

It will bee profitable also to cover all with double cloathes and swathes, wet in oxycratum: which done, you shall lay the member at as much ease as you can, upon a Cushion not filled with Feathers but with Branne, which will hold it up steady in the posture you place it in. This first dressing you shall not stirre of foure dayes, if it be in Winter; in Summer not of two dayes, unless there bee great necessity. As for the tyes wherewith you knit up the vessels, you shall not stirre them at all till the flesh be growne upon the orifices of the vessels. Which you shall hasten with this poulder, which is refrigerant, adstringent and emplasticall. *Recipe Boli armeni, farina hordei, picis res. Gypsi, ana uncias duas. Aloes, nucum cup.*

*cup. Cort. gran. ana semunciam: incorporentur omnia simul, fiat p
subtilis.* Strew it upon the whole wound for three or foure
sings, then onely upon the vessells, and that doe eight or tenne
sings, till you bee past feare that they should bleed againe. In
meane time upon the rest of the wound you shall apply a digel
till it become purulent, that is, till you perceive the quittance to
ceede; then you shall forbear the digestive, and apply *deter*
and *mundificatives*. Such as this is which followes.

*Recipe Terebint. Veneta Lota in aqua vita, uncias tres, mellis
Colati unciam unam semis, succorum plantag. apij, Centaurij mi
unciam unam, bulliant omnia simul ad consumptionem succo
auferantur ab igne, addendo farina fabarum & hordei ana sem
am; Theria. Gal. drachmas duas, aloes, myrrha, Arist. ana un
unciam semis, Croci semi scrupulum. fiat mundificativum.*

I said before, that it is ordinary for the Patient, long afte
member is cut off to imagine he yet hath it, and that he fees
in it. Now you must know that this is not altogether wit
cause. For the nerve or sinew which is cut in sunder contra
selfe towards his originall, and that contraction induces a
much like a convulsion. For as *Galen* writeth in his booke, *De
in musculorum*, the proper action of a nerve and a muscle is
traction. Their tension is not so much an action as a mo
Wherefore you may ease that convulsive paine, by anointing
ridge of the backe, and the whole member also; with this fol
ling Liniment.

*Recipe, Salvia, Chamapitheas, Majorana, rosis marini, mentha,
Lavendula ana m. i. Florum Chamemeli, meliloti, summitatum
thi & hypericonis ana, p. ij, baccarum Laur. & Juniperi, ana un
duas, Rad. Pyrethri drachmas duas, Mastich. Assae odorat. ana
am unam semis, Terebint. Veneta libram: olei Lumbric. anethi,
tollorum, ana uncias sex, olei Terebint. uncias tres, Axungia H
uncias duas. Croci drachmam unam, vini albi odoriferi Libram,
quantum sufficit; contundenda contundantur, pulverisentur, de
macerentur omnia in vino per noctem, postea coquantur cum olei
axungia praedictis in vase duplici, fiat Linimentum secundum ar
In fine adde Aqua vita drachmas tres.*

In the meane time whilst your Cure thus proceedeth, you
have a diligent respect to the scaling of the bone or bones w

your Saw touched, and the aire tooke in your operation, for they must scale. You shall therefore at convenient time, with an actuall Cautey, that is, with a hot iron, seare them so carefully that you touch no part of the flesh or the vessels; neither must you much hasten the scale away, but move it lightly now and then, and commit the rest to Nature, which haply will shoot them within thirty dayes after the dismembring, it may be latter. Finally, after all this is done, when there arises any proud and spungie flesh, you shall sneape and prohibite it with Catheretickes, as *Calcantimum verum*, *pulvis Mercurij*: and the like; especially boyled (or as we call it) burnt Alum in poulder is excellent in this case, whether you use it by it selfe, or mingle it with the rest.

This Course you shall continue till the wound be healed, and the Cicatrice be growne upon it: altering your medicines as your discretion, and the condition of the wound shall advise you, according to the Method before proposed.

CHAP. XXXIIII. /

Pareus his Reason, why for the staying of the blood, when a member is cut off, he doth not use the ordinary way of Cauteyizing with the hot iron, but this which we have before related.



Confesse (saith *Pareus*) that I was wont to stay the Flux of blood which followed upon dismembring, after another manner than I have before set downe, but I am sorry and ashamed that I have so done, yea I therein followed the practise of my Masters and Teachers, who thought themselves sufficiently furnished to stay a flux of blood when they were provided of hot Irons and Causticke Medicines which they might use at their discretion. Now I cannot remember my former practise without horrour. For it put my Patients to insufferable paine, because the operation was administered upon living and sound flesh, whose sense is most exquisite. Neither

Neither indeede can any Causticke be applied to a Nervous but the vehement impression of the fire, will be suddenly communicated to the *Viscera* or noble parts, whereupon must ensue mane dire symptoms and oftentimes death it selfe: For my account, saith *Pareus*, I have scarce knowne that the thirde of such as have beene so dealt with, have escaped, and those without great difficulty: because those wounds which are but feared, are very hardly brought to a Cicatrice; for the burn stirres up insufferable paines, from whence come Feavers, vulsions, and the like, or worse accidents. Adde hereto, that a Causticke, when the Eschar falls off, there often happens a Flux of Blood and then the Causticke must be applied againe; which is to torment the Patient, not onely with an insufferable, but an often returning paine, in the application of the Caustick, ite againe and againe, by which repetition, the fleshy and nervous stance of the part, is by degrees consumed, and so the bones laic so that divers such Patients could never get a Cicatrice to grow on the wound, but have carried an Ulcer in the place where member was cut off, all the dayes of their miserable life, But where such an Ulcer is, it is not possible to weare an artificial or Legge, which we see many doe, so cunningly adapted that it not easily be discerned by others, nor very much missed by him wants it. Wherefore, saith *Pareus*, I earnestly intreat all Chirans, that they would (being admonished) give over that cruel Butcherly kinde of Curation, and practise this which I have scribed, taught me, as I interpret it, by the suggestion of some Angel. For I neither learned it of my Masters, nor of any other onely I read in *Galen*, in the fift Booke of his *Method*, that to Flux of Blood, there is no remedy so present as to tye up those vessels that bleed toward their roots, that is toward the Liver and Heart. Now I conceived that this doctrine of *Galen* for the ding and sewing up of Veines and Arteries in fresh wounds, well be used in the like vessels after a dismembring; and ther I put it in practise, yet so that in the beginning, I had alwayes teries and hot Irons in a readinesse, that if my project fayle might flie to my abhorred, but necessary reliefe. But when I the experience of the facility, and the felicity of the course I hold in a multitude of my Patients, then I bade an eternall ad

Cauftickes and hot Irons in this operation? And thus I wish all Chirurgions to doe. For it is not in our Art as it is in Civill affaires, that Prescription, Law, or Authority should prevaile over right reason.

FjNjs.

The Contents.

Chap. I. For the opening of Tumors.	Folio 1	nesses of the bones of the Scull.	6
Chap. II. Of Cauteries.	5	Chap. XX. Of the mischiefs that happen	6
Chap. III. Of some Instruments to be used		to the dura meninx in the fractures of	6
the swelling and exulceration of the		the Scull.	6
Columella or Vula.	9	Chap. XXI. Of wounds of the necke and	6
Chap. IIII. Of the Paracentesis in the		throat, and of stanching of blood.	6
Dropfie.	13	Chap. XXII. Of the wounds of the Cheek	7
Chap. V. Of Ruptures.	15	Chap. XXIII. The division and signes	7
Chap. VI. Of the Golden Ligature, or		Gunshot wounds.	7
golden Panch, as they call it.	19	Chap. XXIII. What must first be done	7
Chap. VII. Of five kinds of Sutures.	22	in the cure of wounds by Gunshot.	7
Chap. VIII. Of some offences in the eyes.	28	Chap. XXV. Of the first dressing after	8
Chap. IX. Of some offences about the		the Bullet is drawne out.	8
Nose and the Eares.	30	Chap. XXVI. Of the second dressing.	8
Chap. X. Of the convulsion of the mouth.	32	Chap. XXVII. What remains after	9
Chap. XI. Of the five sorts of fractures		ward for the Chirurgian to doe.	9
of the head, and of the signes of a frac-		Chap. XXVIII. Of wounds made with	9
ture in generall.	33	Arrows, Darts, Iavelins, and other	9
Chap. XII. Of Fissures of the Scull, the		such sharpe weapons.	9
first kinde of fracture.	36	Chap. XXIX. Of the nature of a Gangrene.	10
Chap. XIII. Of contusions of the Scull, the		Chap. XXX. Of the signes of a Gangrene.	10
second kinde of fracture.	41	Chap. XXXI. Of the cure of a Gangrene	10
Chap. XIII. Of an Effrature of the Scull,		curable; before it come to perfect mortification.	10
the third kind of fracture.	44	Chap. XXXII. Of the Att and manner	10
Chap. XV. Of the seat, the fourth kinde		of dismembring.	10
of fracture.	47	Chap. XXXIII. What the Chirurgian	10
Chap. XVI. Of the counter Fissure which		must doe after the member is cut off.	10
is the first kinde of fracture.	48	Chap. XXXIII. Pareus his Reason	10
Chap. XVII. Of the Tripan or Trepan.	49	why for the slaying of the blood when	10
Chap. XVIII. Of the places of the Scull		member is cut off, he doth not use the	10
which will not beare the Trepan, of the		ordinary way of Cauterizing with the	10
temporall muscle, and of fungous flesh.	60	hot Iron, but this which we have be-	10
Chap. XIX. Of the corruption and rotten-		fore related,	10

FINIS.

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happ
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